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Original Communications.

*A PRELIMINARY NOTE ON SOME EXPERIMENTS TO DETERMINE WHETHER ALCOHOL DOES GOOD IN INFECTIONS BY INCREASING THE BACTERIOLYTIC POWER OF THE BLOOD.**

BY H. A. HARE, M.D.,

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No one who has given thought to the subject of the treatment of disease can fail to have been impressed with the fact that much of our therapy is based upon empiricism rather than a clear conception of the manner in which certain remedies do good. This is because in many instances we have not a definite conception of the pathological process underlying the malady or the symptoms which are to be relieved. It is a curious fact that in the only diseases for which specifics have been found we were in one instance, and are in the other instance, ignorant of the cause of the illness, namely, malarial infection and syphilis. A very near associate of quinine and mercury, in so far as their empirical use is concerned, is alcohol in its various medicinal forms, for notwithstanding some differences of opinion, it is not to be denied that physicians of experience the world over employ this drug to combat serious infections, and

*Read before the Association of American Physicians in Washington, May, 1903.

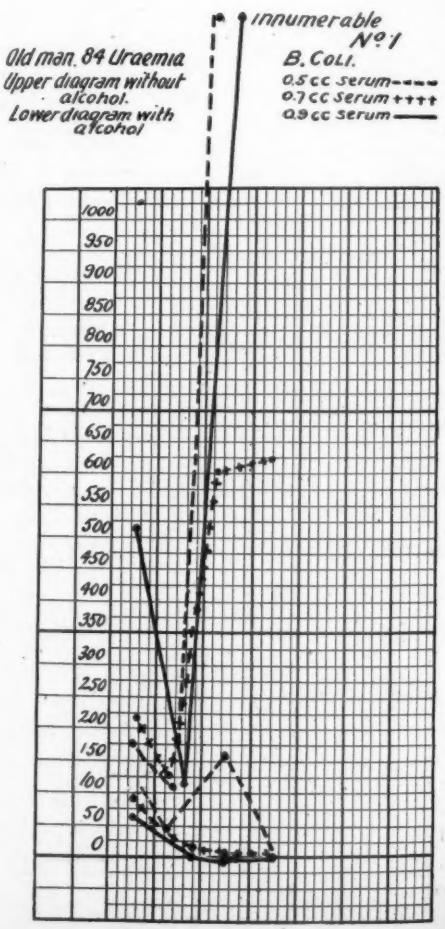
obtain from its use results which cause them to rely upon it when other remedies fail. This is notably the case in the infectious diseases of a febrile type, and peculiarly so in two conditions depending largely upon bacteriemia, septicemia, or the popular blood poisoning, and typhoid fever.

There is not space, even if it were wise, to discuss the very extraordinary divergence of view, or rather antagonism, which exists between experimental investigators on the one hand and clinicians on the other in regard to the effect of alcohol. The one school claims that it is always a depressant poison to all protoplasm in any dose, and that it never acts as a stimulant in the true sense, while the other uses it with an implicit faith based on bedside experience, shaken a little by the statement of the laboratory worker.

It is incredible that thousands of skilful men should be in error as to the value of alcohol in therapeutics. Some explanation must exist. It has occurred to me that possibly the good might be achieved by the influence of alcohol upon bacteriolysis, and I wish to report at this time a preliminary research which for certain technical and other reasons is as yet imperfect and incomplete. The chief difficulty in making this research an extensive one lay in the fact that I found it almost impossible to find patients whose condition was such that a test of any length could be carried out. Even in so prolonged a disease as typhoid fever there are marked changes in the condition of the patient from week to week, if not from day to day, and therefore it required patients who were suffering from some chronic malady, which had impaired their vital resistance, but which did not at the same time progress so rapidly toward death or recovery as to produce striking changes from day to day in the organism. For this reason I place little confidence in the results obtained from examining the blood of typhoid fever patients. In other words, I can be by no means certain that the bacteriolytic increase or decrease does not depend more upon the natural history of the disease than upon the effect of alcohol. The results, however, obtained in some of the cases of typhoid fever are of interest in that they correspond to those obtained in the other cases which I am about to cite, in which the patients suffered from chronic affections varying but little from day to day and week to week. In other cases of enteric fever the results were so manifestly produced by changes in the disease that they are not cited.

The first case was that of an old man of eighty-four suffering from chronic renal disease and marked uremia of a subacute type, in whom the administration of alcohol seemed to produce a distinct increase in bacteriolytic power. His blood was tested on the 29th of October, having been taken on the 28th. He was given eight ounces of whiskey on each of the next succeeding five days, the blood being tested at the end of that period while the alcohol was still being taken.

The results obtained when 0.9 cubic centimeter of blood was used before al-



cohol showed immediately 516 colon bacilli, at the end of four hours 111, and in twelve hours they were innumerable; whereas after the alcohol had been taken examination showed immediately 76 bacilli, and after that the plate was sterile.

Somewhat similar results were obtained with 0.7 and with 0.5 cubic centimeter of serum, but smaller quantities failed to destroy the colon bacillus after alcohol was used.

The results are well shown in Chart 1, the details of which are to be found in the accompanying table (Table 1).

Before alcohol.

	Immediate.	4 hours.	12 hours.	24 hours.
Control	73	61	Innumerable.	Innumerable.
0.1 cc. blood	32	62	1,432	Innumerable.
0.3 cc. blood	39	49	53	256
0.5 cc. blood	184	120	Innumerable.	Innumerable.
0.7 cc. blood	220	132	608	620
0.9 cc. blood	516	111	Innumerable.	Innumerable.

After alcohol.

	Immediate.	4 hours.	12 hours.	24 hours.
Control	364	6	Innumerable.	Innumerable.
0.1 cc. blood	195	134	1,417	Innumerable.
0.3 cc. blood	99	74	44	185
0.5 cc. blood	94	49	162	10
0.7 cc. blood	60	17	Sterile.	Sterile.
0.9 cc. blood	58	Sterile.	Sterile.	Sterile.

The results obtained with the bacillus typhi, used simultaneously, are not quoted because the blood at all times killed all of them. This experiment was made during preliminary tests and while searching for a more accurate process. It is quoted only because it is in accord with those in which more accuracy was possible, and so is in the nature of a confirmation of the experiments about to be described, which I am free to confess are so decisive that had I not perfect confidence in the technique, combined with the fact that the bacteriologist did not know what blood was being worked with, I would be inclined to suspect an error. The possibility of error was further avoided by having several persons make the count.

The second patient was one suffering from chronic tubercular infection of the lungs, bowels, and peritoneum, of that slow, chronic type which gets worse so gradually that the difference can scarcely be noted from week to week, although the malady was so severe that the patient was emaciated to the last degree and had lost all control of the anal sphincter.

The method of experimentation, so far as the bacteriological research was concerned, was as follows:

The clear serum was removed from the clot by means of a sterile graduated pipette, and portions of 0.1, 0.3, and 0.5 cubic centimeter transferred directly to small test-tubes in which had been placed 0.9, 0.7, and 0.5 cubic centimeter respectively of physiological salt solution and also three drops of bouillon.

The inoculations were made from suspensions in physiological salt solution of B. coli and B. typhosus, the organism for these suspensions being taken from eight-een-hour-old agar slants. The suspensions were so made that they held about 50,000 organisms to the *oese,* a condition which, after some experimentation, was determined by the degree of opacity of the liquid. These suspensions were allowed to stand for one-half hour to permit dead organisms and clumps to fall to the bottom.

Six loopfuls of the inoculating material were transferred to each portion of serum to be tested, from which three loopfuls were immediately plated on nutrient agar. The tubes were then placed in an incubator at 37° C., and at intervals of one, three, five, and twenty-four hours series of plates were made, using three loopfuls for each. These were counted when from eighteen to twenty-four hours old. The "controls" mentioned were six loopfuls of suspension in one cubic centimeter of physiological salt with three drops of bouillon. The "suspensions" consisted of one loopful of the organisms suspended in the salt solution transferred to an agar tube and immediately plated.

It will be observed that, accepting the suspension as 50,000 per *oese,* each ex-

perimental tube was supplied with approximately 300,000 organisms.

The colon and typhoid bacillus were employed to check one another. It was found that in nearly every case the bacteriolytic power of the blood was sufficient to destroy the typhoid bacillus, even if alcohol was not employed. This was not true of the colon bacillus, which is very much more tenacious of life, and the results which are stated below are based upon the bacteriolytic power of the blood upon the colon bacillus. The results, I think, show clearly that alcohol increases the bacteriolytic power of the blood when given in ordinary medicinal doses, at least in certain cases, and that this increase in bacteriolytic power is in direct ratio to the size of the dose, both in rapidity and degree.

The charts of this experiment follow, and the detailed tables from which they are made are appended.

When the alcohol was first begun and given in very small doses, as stated below, the bacteriolytic power was very poor. When the dose was gradually increased the bacteriolytic power also increased, and when the alcohol was stopped, it fell again. When the alcohol was renewed it rose again (see Charts *2a*, *2b*, *2c*).

Alcohol, half-ounce (15 cc.) t. i. d. (45 cc. a day) from January 18 to 22.

Blood drawn January 22, 4 P.M.; received January 23, 1903, 9.30 A.M. Used 11 A.M., January 23.

Colon.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	67,400				
Control	780	1,362	9,166	Innumerable.	Innumerable.
0.1 cc. serum	540	187	359	2,849	Innumerable.
0.3 cc. serum	499	55	332	2,542	Innumerable.
0.5 cc. serum	608	39	192	1,861	Innumerable.

Alcohol, half-ounce (15 cc.) every four hours (90 cc.) from January 22 to January 28.

Blood drawn January 28; received January 29, A.M. Used 11.30 A.M., January 29.

Colon.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	60,336				
Control	821	1,274	16,236	Innumerable.	Innumerable.
0.1 cc. serum	737	156	172	45	Innumerable.
0.3 cc. serum	712	75	34	32	12,300
0.5 cc. serum	729	9	21	19	8544

Alcohol, 5 drachms (20 cc.) every three honrs (150+ cc. a day) from January 29 to February 3, and 6 drachms (24 cc.) every three hours (190 cc.) from February 3 to February 10.

Blood drawn February 10 at 4 P.M.; used February 11 at 11 A.M.

Colon.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	54,500				
Control	327	457	520	707	Innumerable.
0.1 cc. serum	670	241	36	10	Sterile.
0.3 cc. serum	592	198	12	3	Sterile.
0.5 cc. serum	324	144	5	5	Sterile.

Alcohol, 6 drachms (24 cc.) every three hours (190 cc.) from February 10 to 13, and 3 drachms (12 cc.) every three hours (96 cc.) from 13th to 15th, but no alcohol had been given for two days at time of drawing blood.

Blood drawn February 17. Received February 18; used at 11 A.M.

Colon.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	33,500				
Control	700	862	1,513	22,144	
0.1 cc. serum	252	4	0	0	
0.3 cc. serum	89	0	0	0	
0.5 cc. serum	30	0	0	0	

No Alcohol for ten days.

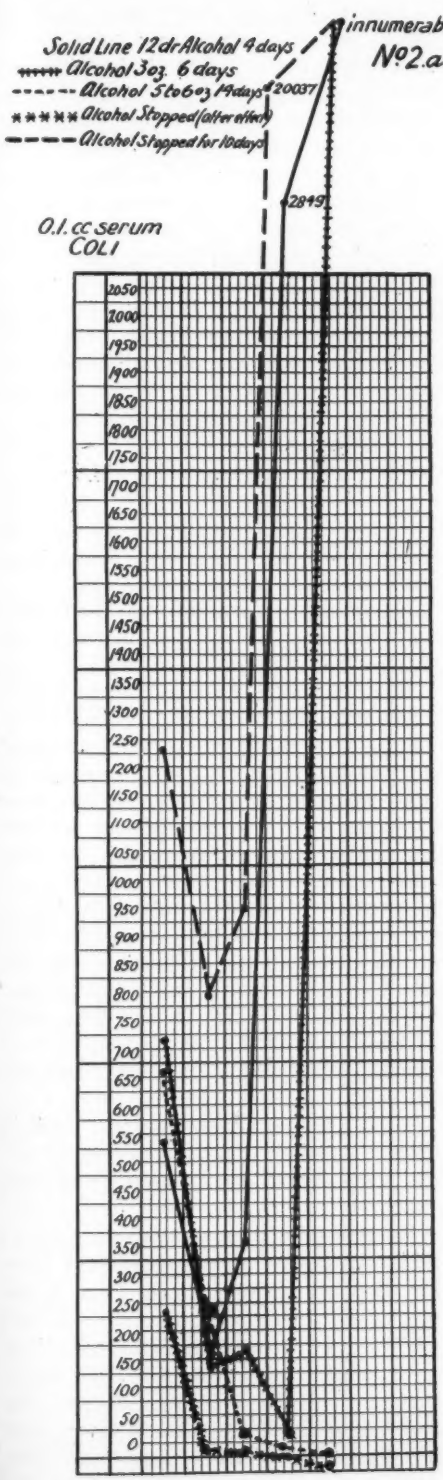
Blood drawn February 25. Received February 26; used 12 M.

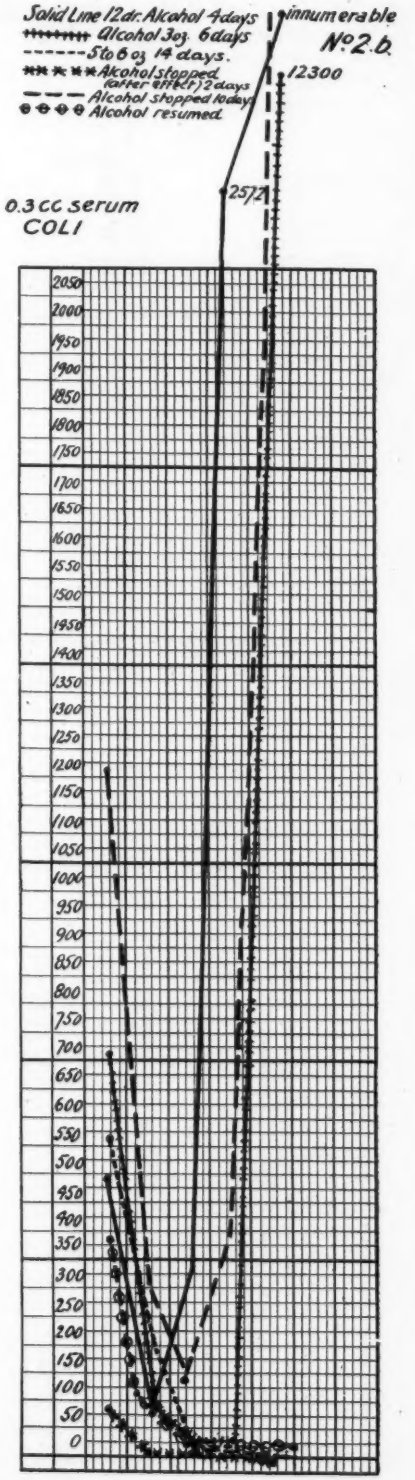
Colon.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	71,040				
Control	9,360	1,051	3,420	45,360	Innumerable.
0.1 cc. serum	1,245	833	982	20,027	Innumerable.
0.3 cc. serum	1,219	301	171	381	Innumerable.
0.5 cc. serum	1,047	286	18	104	40,200

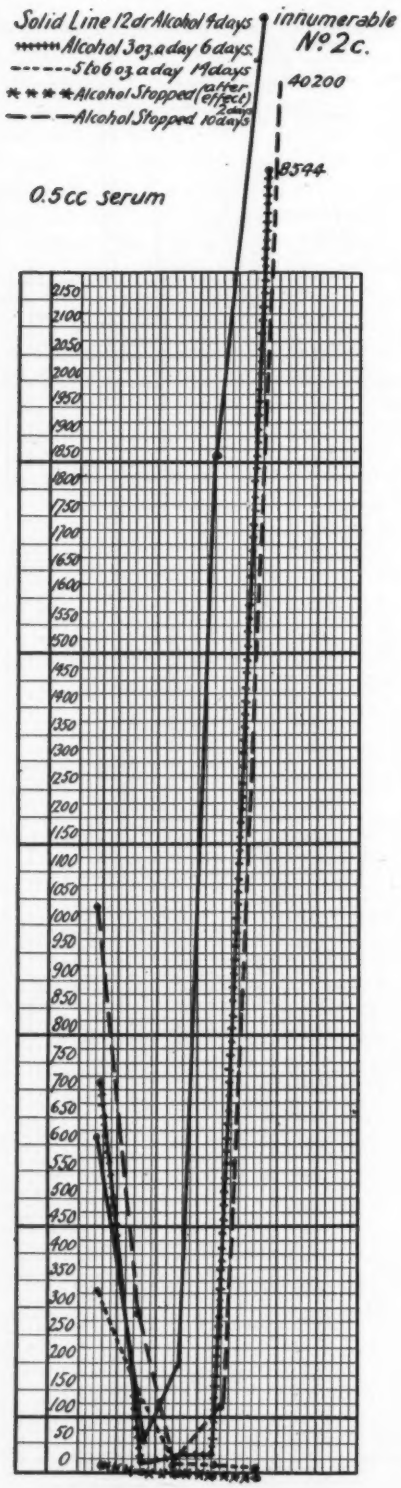
Alcohol for six days. Six drachms (24 cc.) every three hours (190 cc. a day).

Blood drawn March 15, 4 P.M.; used March 16, 4 P.M.

Colon.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	46,900				
0.3 cc. serum	360	116	37	14	Sterile.


Solid Line 12 dr Alcohol 4 days
Alcohol 3 oz. 6 days
Alcohol 5 to 6 oz 14 days
Alcohol Stopped (after effect)
Alcohol Stopped for 10 days
innumerable
No 2.a.
20037
2849
0.1 cc serum
COLI
2050
2000
1950
1900
1850
1800
1750
1700
1650
1600
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0


Solid Line 12 dr. Alcohol 4 days
Alcohol 3 oz. 6 days
5 to 6 oz 14 days.
Alcohol stopped (after effect) 2 days
Alcohol stopped 10 days
Alcohol resumed
innumerable
No 2.b.
12300
2572
0.3 cc serum
COLI
2050
2000
1950
1900
1850
1800
1750
1700
1650
1600
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0



The third experiment that I desire to report was also made in a case of advanced peritoneal tuberculosis with pulmonary lesions. The same methods were employed and the following results obtained (see Chart 3*a*, 3*b*), which, while they are not so striking as they were in experiment No. 2, are distinctly confirmatory of it. Thus it will be seen that when no alcohol was given the organisms were innumerable in twenty-four hours, whereas when alcohol was administered, at the end of twenty-four hours they only numbered 1300 if the dose was small, and 18,200 if it was larger. When the alcohol was stopped they became innumerable again at the end of twenty-four hours. This held true when either 0.3 or 0.5 cubic centimeter serum was used. The smaller quantities of serum were too feeble to produce any effect. (For detailed records see top of page 296.)

No details of the tests with the bacillus typhosus are given, as they were destroyed by the serum in all tests at once.

I also carried out the following experiments in a case of typhoid fever with the colon and typhoid bacillus, but the typhoid bacillus was again at once destroyed in both experiments. At the time they were made the skill in technique had not been attained by long practice, as is shown in the different suspension counts. This record is therefore presented only as being of some collateral interest. It may be urged in this case that the progress of the disease was the cause of the diminished bacteriolytic power, since the low bacteriolytic effect was in the third week, whereas the high effect with alcohol was in the second week.

Male, aged twenty-six years. Typhoid fever. Alcohol was given during the second week in the dose of about 10 drachms a day.

Immediately after the exposure to 0.5 cubic centimeter of the serum the number of colon bacilli equaled 2059, in one hour 514; in three hours the plate was sterile, and remained so at the end of the third, fifth, and twenty-fourth hours; whereas, when alcohol was stopped, and the blood was tested one week later, being the third week of the disease, the follow-

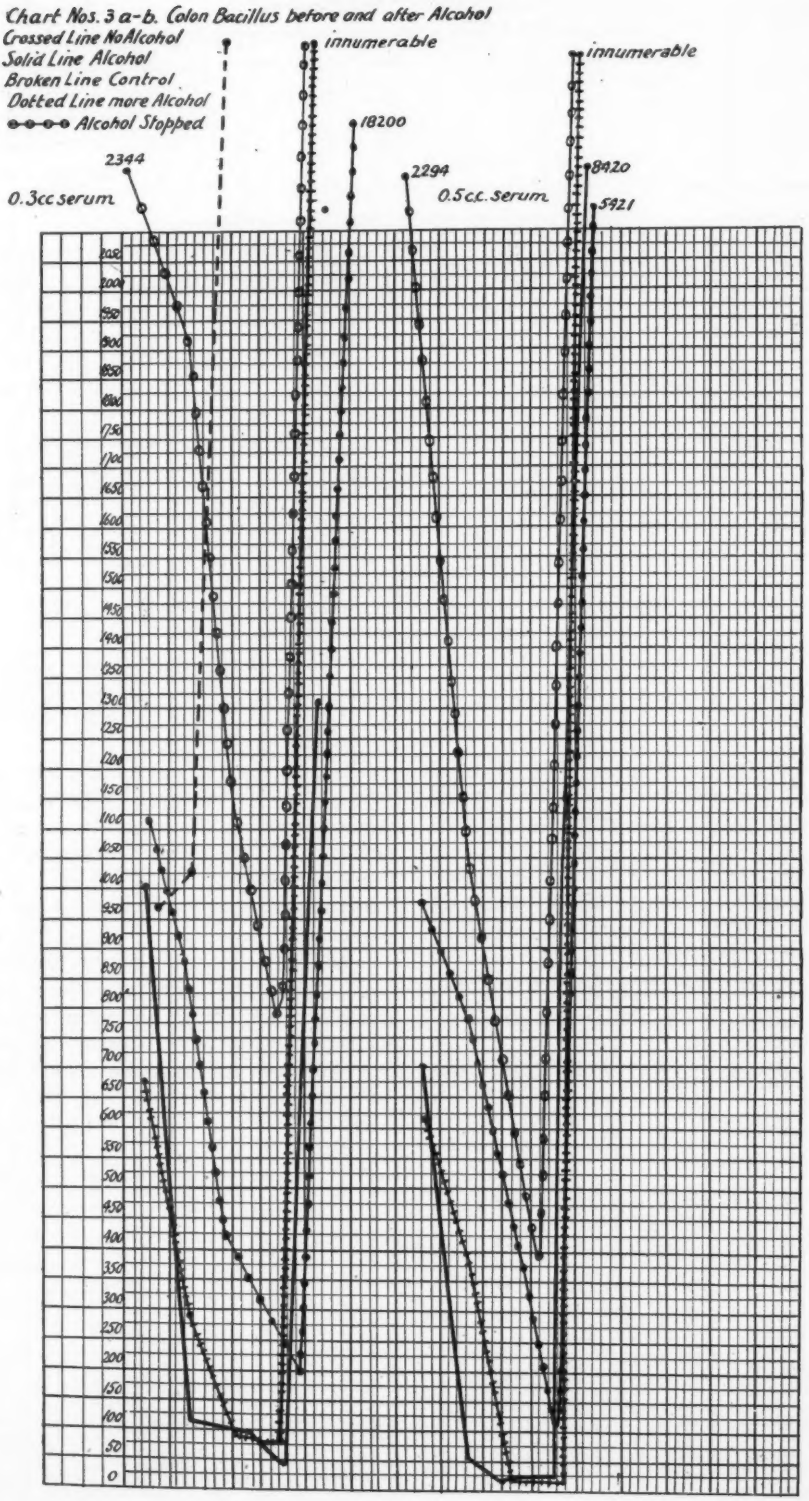


Chart Nos. 3 a-b. Colon Bacillus before and after Alcohol
Crossed Line No Alcohol
Solid Line Alcohol
Broken Line Control
Dotted Line more Alcohol
Alcohol Stopped
innumerable
innumerable
18200
2344
2294
8420
5921
0.3cc serum
0.5c.c. serum

No alcohol whatever.

Blood drawn March 25, 4 P.M. Received March 26; used 11 A.M.

B. Coli.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	50,500				
Control	774	752	5,453	33,517	Innumerable.
0.1 cc. serum	779	397	392	1,706	Innumerable.
0.3 cc. serum	662	297	75	70	Innumerable.
0.5 cc. serum	630	398	15	14	Innumerable.

Alcohol, 4 drachms (16 cc.) every four hours, 3 ounces (96 cc.) a day, from March 25 to March 30.

Blood drawn March 30. Received March 31, 1903; used 11 A.M.

B. Coli.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	56,300				
Control with no serum	930	1,030	15,020	Innumerable.	Innumerable.
0.1 cc. serum	1,020	200	150	52	Innumerable.
0.3 cc. serum	1,002	102	87	40	1,300
0.5 cc. serum	700	50	20	15	8,420

Alcohol, half an ounce every three hours (15 cc.), 4 ounces (124 cc.) a day, from March 30 to April 7.

Blood drawn April 7. Received April 8, 9 A.M.; used 12.15 P.M.

B. Coli.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	49,800				
Control	1,340	1,113	1,854	16,504	Innumerable.
0.1 cc. serum	1,001	980	1,150	413	Innumerable.
0.3 cc. serum	1,123	879	427	201	18,200
0.5 cc. serum	959	789	413	129	5,421

Alcohol stopped for one week.

Blood drawn April 14. Received April 15, 1903, 9 A.M.; used 11.30 A.M. Fourth test.

B. Coli.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	75,000				
Control	3,630	1,383	18,172	Innumerable.	Innumerable.
0.1 cc. serum	752	1,409	1,510	1,564	Innumerable.
0.3 cc. serum	2,347	1,908	1,192	787	Innumerable.
0.5 cc. serum	2,294	1,193	692	365	Innumerable.

ing results were obtained with the colon bacillus: Immediately after the bacillus numbered 943, in one hour 168, in three hours 20, in five hours 4, and at the end of twenty-four hours they were innumerable, instead of being entirely destroyed as when alcohol was used. This effect did not take place when 0.3 cubic centimeter of serum was used, the two curves being about equal. These results are shown in Charts 4*a* and 4*b*.

The details of the count in this case follow:

Alcohol, 10 drachms (40 cc.) a day.

Colon.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	202,560				
Control	3,296	2,724	10,383	Innumerable.	Innumerable.
0.05 cc. serum	9,579	1,860	598	371	Innumerable.
0.1 cc. serum	6,238	1,441	190	38	Innumerable.
0.3 cc. serum	2,766	880	9	2	Innumerable.
0.5 cc. serum	2,059	514	Sterile.	Sterile.	Sterile.

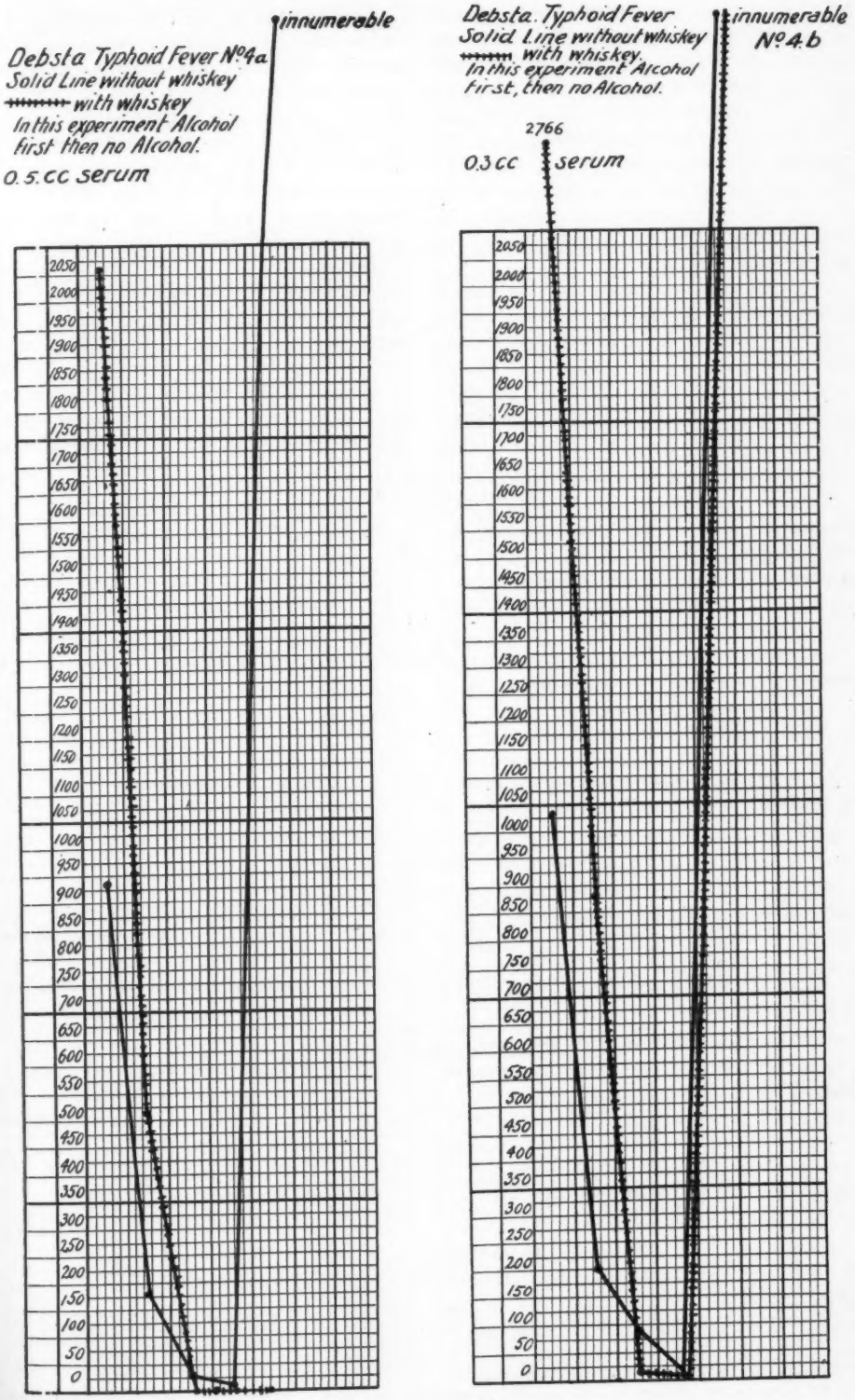
*No alcohol.**

Colon.	Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension	71,608				
Control	1,176	7,388	Innumerable.	Innumerable.	Innumerable.
0.1 cc. serum	1,229	249	129	55	Innumerable.
0.3 cc. serum	1,031	200	85	14	Innumerable.
0.5 cc. serum	943	168	20	4	Innumerable

The interesting question arises as to whether the increase in bacteriolytic power when 0.5 cubic centimeter was used depended upon an influence exercised upon the complemental body. The following experiments with this end in view were performed.

The study of the relative amount of complement was made by adding definite quantities of fresh, unheated serum to measured quantities of serum which had been heated for one hour at 56° to 58° C. Each mixture was then made

* The non-alcohol record follows that with alcohol because in this case it was alcohol first, and no alcohol afterward.


innumerable
Debsta Typhoid Fever No 4a
Solid Line without whiskey
with whiskey
In this experiment Alcohol
first then no Alcohol.
0.5 cc serum
2050
2000
1950
1900
1850
1800
1750
1700
1650
1600
1550
1500
1450
1400
1350
1300
1250
1200
1150
1100
1050
1000
950
900
850
800
750
700
650
600
550
500
450
400
350
300
250
200
150
100
50
0
Debsta. Typhoid Fever
Solid Line without whiskey
with whiskey.
In this experiment Alcohol
first, then no Alcohol.
innumerable
No 4 b
2766
0.3 cc serum

up to 1 cubic centimeter with sterile physiological salt, inoculated from the suspension as above described and plated. Complement tests were not attempted in cases No. 1 and No. 4. Unfortunately the serum for the second half of the complement test in case No. 2 was lost through the breaking of the tube containing it. The following record as to complement therefore deals with the serum from case No. 3.

This chart (No. 5*a*) shows the results reached with the bacillus typhosus when 3 cubic centimeters of heated serum was reactivated by 2.5 per cent of unheated serum. A chart of the effect of 5 per cent is not shown, as that quantity is so powerful as to kill all the B. typhi in all tests.

The activity of the complement of the serum upon the bacillus typhosus after alcohol, when 2.5 per cent of unheated serum was used to reactivate, was greater than it was during the time before alcohol was given and after alcohol was stopped. When the bacillus typhosus was exposed to serum reactivated by 5 per cent of unheated serum, it destroyed the microörganisms speedily in all the experiments except the last, in which they multiplied enormously. It is to be noted that in the ordinary experiments to determine the bacteriolytic influence of the serum upon the bacillus typhosus, the serum in all cases so speedily destroyed these microorganisms before alcohol was given, during its administration, and after it was

Before alcohol.

Complement test with *B. Typhosus.*
Blood drawn March 25; used March 26.

Suspension		55,500				
Control of whole serum 0.3 cc.+ physiological salt solution to make 1 cc...		702	12	Sterile.	Sterile.	
Heated serum.	**Unheated serum to reactivate.**					
.3 cc.	2.5 per cent	1,030	400	105	15	10,700
.3 cc.	5 per cent	1,020	52	Sterile.	Sterile.	

Alcohol, 4 drachms (16 cc.) every 4 hours, 3 ounces (96 cc.) a day.

Blood drawn March 30, at 10 P.M.; used March 31, 11 A.M.

Heated serum.	**Unheated serum to reactivate.**					
.3 cc.	2.5 per cent	2,522	270	16	2	720
.3 cc	5 per cent	1,706	65	0	0	Sterile.
.3 cc.— as control complement is removed.		1,906	1,309	1,835	1,936	Innumerable.

Alcohol increased to 4 ounces (125 cc.) every twenty-four hours.

Heated serum.	**Unheated serum.**					
.3 cc.	2.5 per cent.	1,200	1,044	134	14	1,002
.3 cc.	5 per cent.	1,030	742	25	2	0

Alcohol stopped for one week.

Blood drawn April 14. Received April 15, 1903, 9 A.M.; used 11.30 A.M.

B. Typhosus.		At once.	1 hour.	3 hours.	5 hours.	24 hours.
Heated serum.	**Unheated serum.**					
.3 cc.	2.5 per cent.	1,680	2,236	689	371	Innumerable.
.3 cc.	5 per cent.	2,653	2,210	164	88	10,490

With the bacillus coli in the complement experiments in Case 4 the following results were obtained:

Before alcohol.

Complement test with bacillus coli. Blood of March 26.

		Immediate.	1 hour.	3 hours.	5 hours.	24 hours.
Suspension		50,500				
Heated serum.	**Unheated serum.**					
.3 cc.	60 per cent.*	920	214	50	10	Innumerable.
.3 cc.	80 per cent.	700	173	60	4	Sterile.

Alcohol, 4 ounces (125 cc.) a day.†

Blood of April 7; used April 8.

Heated serum.	**Unheated serum.**					
.3 cc.	60 per cent.	1,033	1,409	90	760	21,300
.3 cc.	80 per cent.	1,066	1,256	13	429	710

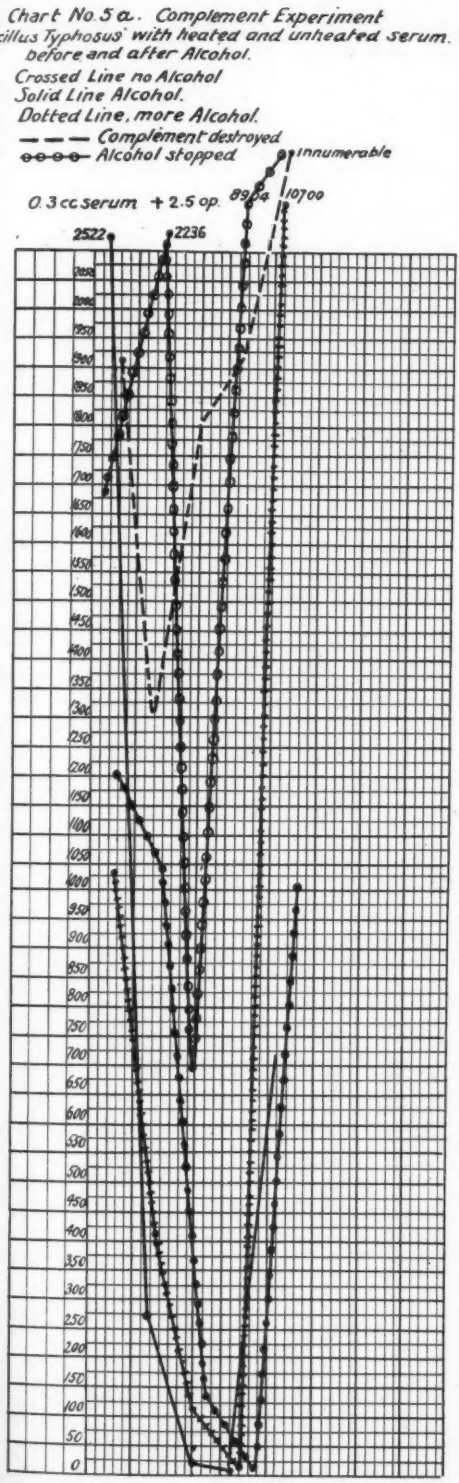
Alcohol stopped for one week.

Blood drawn April 14. Received April 15, 1903, 9 A.M.; used 11.30 A.M.

Complemental test. *B. Coli.*						
Heated serum.	**Unheated serum.**	At once.	1 hour.	3 hours.	5 hours.	24 hours.
.3 cc.	60 per cent.	1,971	1,722	689	8,904	Innumerable.
.3 cc.	80 per cent.	2,517	1,604	570	2,577	Innumerable.

* This per cent is based on Longcope's quantities.

†No complement test with the bacillus coli of the blood of March 30 is given because of an accident which destroyed the plates.



stopped, that it has not been thought worth while to embody these results in this paper; yet in the tests to determine the effect on complement, the same high grade of bacteriolytic influence was not manifested. Whether the practically uncontrolled multiplication of the organisms which took place, in the last experiment to determine the influence of the complement, indicates that the serum through the progress of the disease or the lack of alcohol had lost its bacteriolytic power, or whether this great increase was due to an error in technique or in counting, is difficult to determine.

When the bacillus coli was used with 60 per cent of unheated serum to reactivate, the bacteriolytic power was greater when alcohol was used than before it was given, and after it was stopped. When 80 per cent unheated serum was used with the bacillus coli, the bacteriolytic power was best before alcohol, next with alcohol, and poorest when alcohol had been stopped for a week. Here, again, it is difficult to determine whether the low bacteriolytic power of the reactivated serum was due to impaired complemental activity, or to an error in technique. That it is the latter is pointed to by the fact that in the experiments to determine bacteriolysis alone, the bacteriolytic power was greater when alcohol was given than when no alcohol was used.

1. The conclusions to be reached from this research are that the use of alcohol seems to have the power of combating infectious diseases by increasing the bacteria-destroying power of the blood.

2. While the experiments so far made are too few and too contradictory to determine the question, they indicate so far as they have gone that this effect is produced to some extent at least by an increase in complement.

I desire to thank Miss M. E. Pennington for the care she has exercised and interest she has shown in carrying out the bacteriological details of this research. Her skill has still further convinced me of the accuracy of the work done in the Philadelphia Clinical Laboratory, which is under her direction and control.

Chart 5 b-c Complement Experiment
Bacillus Coli with heated and unheated serum.
before and after Alcohol.
Crossed Line no Alcohol.
Solid Line Alcohol.
Alcohol Stopped.
innumerable
innumerable
b. 60 per cent ser
2/300
89 04
c. 80 per cent ser
2577
2577

*TREATMENT OF CONJUNCTIVITIS, CORNEAL OPACITIES, AND SYPHILITIC IRITIS.**

By Edward Jackson, M.D., Denver, Colo.,
Emeritus Professor of Ophthalmology in the Philadelphia Polyclinic.

Ophthalmia Neonatorum.—The first case that we have to consider to-day is that of an infant brought into the hospital a week ago for ophthalmia neonatorum. It does not present a typical picture of the purulent ophthalmia in the new-born, although it can be properly regarded as a case of this kind. It was not a severe case when we first saw it, and has improved very much within the past week. The swelling of the lids is comparatively slight; the discharge is rather scanty and quite different from the thick pus that may sometimes be seen at the height of the disease. It has more the character, however, of the discharge that you may encounter during the first day or two of an attack, when it is particularly important to recognize the disease with which you have to deal. The inner surface of the lid has the red, somewhat velvety appearance that is commonly presented in a later stage of the disease.

The discharge is slightly discolored by the application that has lately been made to the eye. The case has been treated by frequent cleansing of the conjunctiva, and applications of a solution of one of the new silver preparations. In this disease they take the place of the silver nitrate. I cannot say that they wholly supplant the nitrate; and if the discharge of pus were very free, I would still feel safer to employ the nitrate, at least once in every twenty-four hours. The new silver preparations are, however, very much less irritant than the nitrate; on that account they can be used more freely and more frequently, and they can be more efficiently employed by nurses and attendants, as they require less skill in the manipulation of the eye. In the treatment of these cases the frequent, thorough cleansing of the conjunctival sac with a solution of boric acid, or normal salt solution, or distilled water, must not be neglected. It is the most important part of the treatment.

Chronic Catarrhal Conjunctivitis.—The second case illustrates a totally different form of conjunctivitis, occurring usually at the other end of life. This man, aged seventy, complains of smarting and pricking, and the feeling of "wild hairs in the eye." On everting the lids you will notice they are not red, but rather more pale than normal; and in the retrotarsal folds of the conjunctiva you can see that the comparative paleness of the membrane is due partly to a thin film of gray upon its surface. This film is a thickened epithelial layer. This is one of the forms of chronic catarrhal conjunctivitis. There is little prospect of curing it completely and permanently, but these patients can frequently be afforded great relief by applying to the everted lids a rather weak solution of silver nitrate, say ½ per cent or 2 grains to the fluidounce of water. Such applications should be made at intervals of two or three days to a week. They cause temporary smarting, but when that passes off a relief is experienced which continues for several days, and which is sufficient to induce the patient to come again and again for such applications, over long periods of time.

Corneal Opacities.—The next case I show you to illustrate certain points regarding opacities of the cornea. You will notice that this man's cornea is sprinkled with flecks of light-gray opacity, giving an appearance quite characteristic of the origin of his trouble. Just this appearance is seen only as the result of an explosion. In this case it was an explosion of guncotton, which occurred over thirty years ago. The eye was severely inflamed for the time, and then recovered very good sight. The patient is inclined to think his sight was nearly or quite normal, but this was probably not the case. Within the last few years his sight has failed. He is now also suffering from cataract, on account of which I may bring him before you at a subsequent clinic.

What I want you to notice to-day is the very marked corneal opacity. It is altogether probable that after his injury the cornea slowly cleared up for some months, until very little opacity could have been noticed. Then for many years

*Clinical lecture at the Arapahoe County Hospital, Denver.

the cornea remained comparatively clear, so that he enjoyed vision that served him for all ordinary purposes.

The decided opacity which you now see has probably developed by degenerative changes, occurring in the old corneal scars, at the same time that the changes near the margin of the cornea have produced his so-called arcus senilis. At least, this is the history of corneal opacities in certain cases. The changes thus occurring in a scar render it more noticeable, and a greater obstacle to vision than it had previously been. This man's cataract can be removed. But these opacities of the cornea are not amenable to any known treatment. The mild irritants which are employed to clear up opacities left by corneal inflammation in young people would in this case probably aggravate the trouble.

Syphilitic Iritis.—In our next patient, a man aged twenty-three, you notice some reddening of the eyeball and a dilated pupil. The hyperemia is most marked near the edge of the cornea, the so-called pericorneal zone of redness, indicating that it accompanies an inflammation of the cornea, iris, or ciliary body. You will also notice that the pupil is irregular, and the form of irregularity is so characteristic as to deserve special attention. The pupil would be circular, and of almost maximum size, were it not for a pointed projection of the iris into the pupil from the upper margin.

This is one form of distortion of the pupil. There are others which you may encounter that have a very different significance. You may have a projection of the iris into the pupil that is convex and rounded. In still other cases you may have simply a flattening of one side of the pupil.

A distortion like that shown in our patient means that at some point the margin of the iris has been fastened down to the lens capsule by exudate; and then as the iris has retracted, this pointed projection has developed. The rounded, convex form is produced by exudate or a new growth in the substance of the iris. The flattening of one side of the pupil is a form that generally indicates some injury which may have caused the separation of the iris from its ciliary attachment, or at least has caused a partial paralysis of the iris.

In the case before us, when the patient entered the hospital the redness was very much more marked, and there was a decided discoloration of the iris. This discoloration has disappeared. It was the effect of hyperemia upon the normal color of the iris, the addition of red to the normal gray. With the reduction of hyperemia, the color of the iris has returned to very nearly that of the normal eye. When the patient came into the hospital the pupil was slightly smaller than the pupil of his sound eye, but it reacted very fairly to light and showed no signs of adhesion. It did not, however, dilate well under mydriatics; and two or three days later, before we could obtain full dilatation, this one adhesion had formed. The adhesion has since stretched considerably, so that it is not likely in the future to interfere with the movements of the iris, but something of it will probably remain permanently. You have all no doubt recognized this case as one of iritis. It is a case that is ending, fortunately, in practically complete restoration of the eye to normal. It was seen early, and had been placed upon the proper treatment by the interne, Dr. Buchtel, before I first saw it, and it has run a comparatively brief course.

In contrast with the above is the case of our last patient. This man has been without efficient treatment at a time when it was most needed. You will notice that his pupil, instead of presenting a single projection of the iris into it, shows a border of irregular notches all around. Almost the whole margin of the iris is firmly adherent to the lens capsule. In addition to this, there is a general clouding of the vitreous, which prevents any clear view of the fundus. The eye is quite blind, and even when examined with the ophthalmoscope and direct sunlight, the details of the fundus cannot be made out. The eye appears to be a little soft, although not decidedly so. There is a history of detachment of the retina before the media became so obscure that nothing could be seen behind the lens; and there was a suspicion that this detachment was due to a new growth. There have been points of tenderness in the ciliary region, but under the treatment to be spoken of

the eye has become almost free from redness, the points of tenderness have disappeared, and the fact that the tension of the eyeball is diminished rather than increased somewhat opposes the idea that it contains any malignant growth. However this may be, the case illustrates the results of iritis not effectively treated.

The treatment of iritis must be based on the idea that it depends on constitutional rather than local causes. The two cases before us illustrate the great importance of securing dilatation of the pupil, and preventing adhesions of the iris to the lens by the use of a mydriatic; and yet it is certain that the constitutional treatment of such cases is at least as important as the local treatment. In both the cases we have seen to-day there are histories and collateral symptoms of syphilis. In the first case the infection is of four months' standing, in the other of at least a year. Of all cases of iritis, 60 per cent or more are due to syphilis, and 25 or 30 per cent are classed as "rheumatism," the term being made to cover conditions of autointoxication that are not closely related to rheumatism. In syphilis iritis arises in the secondary stage, the period for active specific treatment. It occurs in perhaps three per cent of all cases of syphilis, and has been held to indicate especial danger from the tertiary lesions.

The treatment in these cases has been actively antisyphilitic—mercury by inunction and internally, and potassium iodide in large doses. Even where the causation by syphilis is doubtful, or where it may be entirely excluded, I prefer to commence with the rather free administration of calomel until it produces some purging, or evidences of a constitutional effect begin to appear. Next in importance to calomel, for the treatment of iritis in general, I would place the administration of salicylic acid or the salicylates, including the so-called aspirin. But while these drugs are specially applicable in most cases of iritis, it should not be forgotten that it is the general condition of the particular patient that is to be treated. I have repeatedly seen cases of syphilitic iritis that had been treated for weeks or even for months with mercury and potassium iodide without improvement, but which made rapid improvement upon stopping the specific medication, and substituting quinine, iron, and a general tonic régime. Such patients had become cachectic, and the inflammation of the iris was dependent rather upon the general cachexia than upon the original specific disease.

On account of its influence upon general nutrition confinement in a dark room for any length of time is not admissible. In some acute cases it is best to pretty well exclude light for two or three days, but in general close confinement is unfavorable. Most cases will do better to get out-of-doors a part of every day, the eyes being protected by dark glasses. Sudden and strong contrasts of light are more unfavorable than continuous exposure to a uniform but moderately strong illumination.

The mydriatic must at first be used in strong solution, and as frequently as you can use it, without causing mydriatic intoxication. This should be the general policy until the pupil is pretty fully dilated. After that has been accomplished enough of the mydriatic to keep it dilated is all that is necessary. The full dilatation must be kept up until all hyperemia has disappeared, and the eye ceases to flush up on exposure to light or upon touching it.

Pain is often a marked symptom of iritis, and at the height of an acute attack it may require special treatment. Morphine should be given in small doses only. Acetanilid and drugs of that class may be used more freely for a few days. Much relief will be afforded by bathing the eye with hot water, for periods of not more than five minutes, repeated every two or three hours. A most valuable measure is local bleeding. The artificial leech applied to the temple, or three or four natural leeches in this situation, will usually give great relief from pain, which often continues for many hours, and may mark the turning point in the disease. The new derivative of opium, dionin, used in one-per-cent solution once a day seems to control pain, in some cases. Stronger solutions are often used, but seem no more efficient. It has a very decided influence in causing edema of the parts, and until we know more of its action it should be used with caution.

THE PREPARATION OF PATIENTS FOR ANESTHESIA.

By John G. Clark, M.D.,
Professor of Gynecology in the University of Pennsylvania.

In preantiseptic days, the chief care of the surgeon was to so fortify his patient's vital resistance by several days of careful preparatory treatment that not only would the dangers of etherization be minimized, but the terrors of septic infection be survived. That laudable pus was a necessity was a surgical axiom. Now that this great danger can so securely be guarded against it is possible that the careful review of the patient's general condition is in many instances passed over very superficially, or is even neglected in the rush of surgical work of large city hospitals.

Anesthetics, if well given, are largely free from danger, but if administered by one without skill or experience may be very hazardous agents, not so much from the immediate as from the more remote effects of the maladministration. If, therefore, I were to broadly interpret the subject which has been assigned to me in this symposium I would dwell upon the preliminary preparation of the anesthetist for his duties and lay more stress upon this part of my subject than on the actual preparation of the patient for anesthesia.

That the mortality in many of the general hospitals of the country is materially increased by the very bad custom of delegating the administration of anesthetics to the junior residents is unquestioned. While American surgery, so far as technical skill is concerned, is superior to that of England, they are much in advance of us in the administration of anesthetics. If our larger hospitals were to adopt the custom of having salaried anesthetists, as obtains in London, there would be a material reduction in the risk arising either immediately or remotely from the administration of anesthetics.

First in the consideration of the preparation of a patient for an anesthetic is the general survey of the chief physiological functions, for upon their activity depends the recovery of the individual from the immediate and remote effects of this profound intoxication. The character of the urine, the physical competency of the heart and lungs, the state of the blood, and the functional activity of the alimentary tract should have close scrutiny. It is quite obvious that the competency of some of these functions may quickly be reviewed. No prolonged observation as to the state of the bowels and the general state of the blood will be required in the great majority of cases, for a few inquiries as to the first and the appearance of the patient's complexion as an index for the blood pigment will be sufficient to set at rest these questions. In severe grades of anemia the hemoglobin should be estimated, for while these patients usually take ether very well they may suffer severely from shock. Which of the pulmonary conditions are contraindications to anesthesia? Of them all the ordinary bad cold may be considered as one of the most hazardous. To say the least the patient who is the subject of an acute coryza suffers severely in recovering from anesthesia, while beyond this is the grave danger of pneumonia. My own opinion, therefore, from an experience of several years, is that a bad cold, either in its acute or waning stage, is a very serious contraindication to anesthesia, and no operation of election should be performed in the presence of this condition. Even an operation of necessity, if it can temporarily be deferred, should not hurriedly be considered. In two or three instances, at the very earnest insistence of patients, I have operated in the acute stage of a bad cold, and always there has been cause for regret. No worse complication for the comfort and safety of a patient after an abdominal operation can arise than a continuous racking cough. The acute cold even of lighter degree is almost invariably made worse by an anesthetic. While in accord with medical sentiment in this regard, I depart rather radically when it comes to a chronic bronchitis. In not a few cases of chronic bronchitis the most gratifying improvement in the pulmonary symptoms has followed etherization. The stimulation of the irritating ethereal vapor apparently assists in overcoming the chronic bronchial inflammation, and the patient may not only materially be improved, but actually made permanently well by this means. Pulmonary tuberculosis, if localized, a sufficiency of lung

space still being left for the full respiratory functions, is not as a rule rendered worse.

Chronic emphysema is always a serious contraindication, according to my experience, and an anesthetic should be avoided if possible.

As to the condition of the heart, I become more and more optimistic relative to the freedom from danger from any of the ordinary cardiac lesions, provided the anesthetic is in skilled hands. The serious danger here is not from profound anesthesia but rather from the early stages of its administration, attended by its horrible nightmares or hilarious happiness. A stage of excitement should be avoided by giving the ether or chloroform very slowly, so that the patient very gradually passes beyond active intoxication or delirious fright to deep anesthesia. In only one case of serious heart lesion have I seen a death, and that occurred in a stage of raving delirium before the patient had taken a half-ounce of ether. In other words, the patient died from excessive physical exertion rather than from the effects of the anesthetic. The same individual would most likely have dropped dead on any vigorous effort. As a rule, therefore, cardiac lesions are not contraindications unless there is evidence of serious failure in compensation, such as edema, great dyspnea, or pulsation of the jugular veins.

Next in the preliminary study of the case, and of the greatest importance, is the careful examination of the urine. If an operation is to be of considerable magnitude, or prolonged, requiring large amounts of the anesthetic, a quantitative as well as a qualitative examination should be made. Renal insufficiency with a small trace of albumin is, in my opinion, much more portentous of danger than a considerable amount of albumin with an approximately normal quantity of urine. For in the light of later researches these cases are much more likely to succumb to a terminal infection, rather than to any toxic effect produced by ether. As in cardiac lesions, I look upon albumin and casts not as a serious contraindication for anesthesia unless there is a marked deficiency in the actual watery constituent. As the result of the study of a large series of cases before and after anesthesia, I have been convinced that ether rarely produces a serious kidney lesion as a sequel if the anesthetic has been in skilled hands.

Given an absence of contraindications, relating to the heart, the lungs, and the kidneys, the chief indication for the preparation for anesthesia is to so perfectly evacuate the alimentary tract and to cleanse the blood of the by-products that are to be excreted by the kidneys that for the twenty-four to forty-eight hours after the operation the patient's excretory apparatus will be engaged in the elimination of the nitrogenous and waste products arising from ether intoxication, and from the increased metabolism incident to any operation or to an infection. Not only should these alimentary and renal systems be as completely evacuated as possible, but increased amounts of fluids should be ingested up to two hours before the operation, with a view to increasing the watery constituents of the blood so as to dilute, as far as possible, the irritant products that may pass through the urinary system. Calomel in one-half-grain doses repeated half-hourly until two grains are taken, followed three hours before the operation by a simple enema, is usually effective. The administration of bromides, morphine, etc., to prevent nausea has not proved satisfactory in my experience. The other minor details, such as the removal of false teeth, the abstinence from food for six hours before operation, etc., are all so well known and generally observed that it is needless to take them up at this time.

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*THE CHOICE OF AN ANESTHETIC.**

By Gwilym G. Davis, M.D.,
Adjunct Professor of Anatomy in the University of Pennsylvania.

The choice of an anesthetic at present is almost as undecided as it has been in the past; ether and chloroform still remain the most popular. Between them it is often simply a question of custom and environment. If one has been educated and accustomed to the use of one, he is likely to continue until his experiences or observation suggest a change.

*Read March 25.

We get into ruts and are liable to adopt routine practices for which there is no justification. It is universally admitted that in anesthetizations there is a certain proportion of deaths from the anesthetic alone. That at least some of these deaths are avoidable is certainly true, and they can be avoided by the proper selection of the anesthetic. Hence it is our duty to avoid the routine use of any single one and endeavor to select that one which is the best for the case at hand.

The old question of the relative safety and desirability of ether and chloroform is just about as unsettled now as it ever was. Ether is said to cause one death in 10,000, and chloroform one in 2000, and the proportionate number of deaths to anesthetizations instead of decreasing has been rather increased.

Personally, I have always felt that as ether had only one-tenth the mortality of chloroform, it was my duty to use the former unless there was some distinct indication to use the latter. I was the more firmly fixed in this view by seeing several narrow escapes from death with chloroform, while none such occurred from ether. It so happened that going to see a friend operate, I found a patient in whom an abdominal hysterectomy was just about being completed. It was noticed by the anesthetist that the patient was not breathing right, and he called the surgeon's attention to it. In spite of all efforts the patient, a comparatively healthy young woman, was dead. This case gave me somewhat of a shock. If such a death could occur to my friend it might just as well occur to me, for I felt he was just as careful a man as myself. How was I to account for the death in order to avoid the same thing happening to myself? The administrator of the anesthetic I knew personally as an able and conscientious assistant, every whit as good as my own. I felt that the position of the patient had something to do with it. She was in the Trendelenburg posture, which I regard as increasing the danger of the anesthetic, but which I feel sure my gynecological friends will dispute. Guyon even goes so far as to say that it is safer than the horizontal position. Whatever the cause in this case, the operation was not severe enough to kill, and ether, which was the anesthetic used, probably did. Some time after another of my friends was examining the interior of the bladder of an old man under ether anesthesia. Suddenly the patient ceased to breathe, got pale, and was dead. These cases, with reports of others, convinced me that ether could kill and did kill, and while a safer anesthetic than chloroform, was one that demanded the exercise of every care and precaution in its use.

The use of mixtures like the alcohol, chloroform, ether (A. C. E.) mixture has never been popular in this country. While they have probably a less mortality than chloroform, they have a higher one than ether alone; therefore, from this point of view, they are not so desirable as ether. The anesthetic mixture of Schleich, in which petrolic ether is mixed with chloroform and ether in order to produce a mixture of a certain density, has not shown itself to be acceptable.

Quite recently Willy Meyer, of New York, has brought out an anesthetic which he has named anesthol. Dr. Weidig had shown that when 43.25 per cent of chloroform was added to 56.75 per cent of ether a more intimate union than a mere mixture was produced. They made a chemical compound or molecular solution. They evaporate together and not separately, according to their different degrees of volatility. Meyer took 83 per cent of this molecular solution of ether and chloroform, and by the addition of 17 per cent of ethyl chloride reduced its boiling point to 104°, which was the degree of volatility he considered most desirable (according to Schleich's theories) for anesthetic purposes. This combination he called anesthol. When part of it is evaporated it does not leave a surplus of chloroform, as does Schleich's mixture. It is to be administered by the drop method on an Esmarch mask. If too much is poured on the patient turns pale, and the respirations become shallow and even cease for a little while, the heart beating strongly. Recovery is quick. On account of the lightness of the anesthesia produced he precedes its administration by a hypodermic of one-twelfth, one-eighth, or one-fourth grain of morphine, according to age, and even repeats the

injection. The average time consumed in anesthetizing the patient, according to Guth, was eight minutes.

In many hundred cases during the past four years Meyer has had two deaths in kidney operations. One of these, however, seems more likely to have been due to hemorrhage.

The rational basis on which this anesthetic has been constructed certainly commends it as being safer than chloroform, and I would prefer it. As regards the use of ether on the one side and chloroform and anesthol or A. C. E. mixture on the other, ether is the least depressing; therefore it is to be used in all cases in which shock is liable to be a prominent factor. Chloroform is absolutely to be eschewed if the patient is to be in a more or less sitting posture. The preference of chloroform to ether for young children is not justified by facts, and ether is far safer for them. In the very old the tendency to bronchitis renders chloroform the more desirable. In suspected fatty heart ether is to be preferred, as it also is in stout, fatty people. In lung troubles, atheroma, and alcoholics, as well as sometimes in the surgery of the brain, mouth, and throat, chloroform (or anesthol) is to be preferred.

In genito-urinary work, personally I would prefer ether, though some might do otherwise.

In the administration of ether the preceding administration of nitrous oxide gas has much to commend it. It was introduced thirty years or more ago by Clover. It tends to obviate the difficulties of inducing anesthesia as well as to shorten the time. It requires special skill to pass from the use of the nitrous oxide to that of the ether without having the patient come from under the influence of the anesthetic. This difficulty was obviated by Clover by using closed etherization, in which the respired air passed in and out of a bag. This method of closed etherization has been repudiated in this country, perhaps not altogether justly, but it can only be dispensed with by an anesthetizer of considerable skill and practice, who is able to *push* the ether when given on a cone or open inhaler, a faculty not well developed in many administrators. The cost of nitrous oxide gas is very great and may form an almost or quite prohibitive item. The apparatus is cumbersome and not readily portable, and all these reasons have militated against its general adoption.

Nitrous oxide gas is familiar to you all. Its effects may last from one-half minute to two minues, but the patient does not become relaxed, so that it is not suitable for reducing luxations and similar affections. The addition of oxygen to the nitrous oxide has, in the hands of Hewitt, increased its value, but it is not generally used.

Bromide of ethyl anesthetizes rapidly and its effects soon pass off. For a child three drachms and for an adult six drachms are to be poured on a towel and held closely over the mouth and nose. Unconsciousness ensues in one-half minute to two minutes. The towel is then removed, and the unconsciousness remains for three minutes.

Lauder Brunton does not consider it a safe anesthetic. Gay knew of one death, and there have been deaths from it in this city. While some of these deaths may have been attributable to an impure article, the drug is not to be recommended.

Recently ethyl chloride (kelene) has come to be used. If one-half to one drachm is poured on a compress of gauze and air excluded, narcosis occurs in twenty to forty seconds and lasts three to four minutes. This can be repeated. Ware, of New York, has used it 1000 times and collected 12,000 cases with one death. He regards it as midway in safety between ether and nitrous oxide.

In conclusion let me recall to your attention the primary anesthesia which can be obtained with ether. In many cases this will be found to be perfectly satisfactory for short operations, and is rapidly recovered from without nausea or other unpleasant after-effects. It has the advantage that if necessary the ether can be pushed and complete anesthesia produced.

I am sure its value and efficiency are not sufficiently known and understood, or its use would be more general. It is a method I have frequently found of value.

THE METHODS OF ADMINISTRATION OF ANESTHETICS.

By Edward Martin, M.D.,
Professor of Clinical Surgery in the University of Pennsylvania.

The agents employed for the production of general anesthesia are, with us in Philadelphia, ether, nitrous oxide, and ethyl chloride. Chloroform is used most exceptionally, and perhaps in part because of this has been attended by a high mortality. It has been shown to be more irritating upon the kidney than ether, and excepting on parturient women, or cases about to be subjected to brain operations, or those suffering from inflammatory lesions of the air-passages, or those who have previously taken it and express a strong preference for its use, it is but little employed by our surgeons.

In regard to the other three agents, the essentials for their safe and uncomplicated action are the selection of a pure drug and the services of an experienced anesthetist. As accessories to an uncomplicated anesthesia the proper choice of an apparatus by means of which the vapor or gas may be administered, and the previous preparation, general temperament, and bodily health of the patient, are important.

Ether is commonly employed for operations which will probably last longer than five minutes. It is often advantageously preceded by nitrous oxide or ethyl chloride.

Nitrous oxide is given for short operations, and when combined with oxygen may be depended upon to keep the patient anesthetized for upwards of an hour. Ethyl chloride is also employed for short operations, but its effect may be indefinitely prolonged and apparently with comparative safety.

In administering ether an original package, not previously broken, should be employed, since ether deteriorates and its vapor becomes irritating when exposed to the action of air and light. Because of this it is well to purchase ether in quarter-pound packages, employing what may be left over after its administration for non-surgical purposes. Though the most experienced anesthetists abroad habitually give ether by the closed method, using the Clover inhaler or an apparatus constructed on similar principles, the practice in this country is to give it by the open method. Probably the inhaler in commonest use is one made by pinning a square of gauze so that it forms a hollow cup. This is laid over the nose and mouth, and the ether is poured upon it. The common mistake in making this inhaler is to employ too little gauze, the air which passes through its meshes being not sufficiently saturated with the vapor of the drug. At least twenty and preferably twenty-four layers of ordinary gauze should be used, and care should be taken to see that the patient breathes through the gauze and not around it. This implies the use of one hand by means of which the borders of the gauze cup are held closely applied to the chin, cheeks, and sides of the nose, whilst from the other hand the ether is poured upon that portion lying immediately over the air-passages. The inhaler which has been received with most favor, because of its safety, simplicity, and efficiency, is that devised by Allis. It is made in a folding and hence easily portable form, and the only objection to it is incident to the fact that it will not fit all faces, and hence at times the air passes between the cheeks and the lower border of the inhaler rather than through the ether-saturated strips of bandage. This may be in part obviated by wrapping a towel about the lower portion of the face-piece so that it projects below the latter, its free borders accommodating themselves to the irregularities of the face.

I am in the habit of using an inhaler consisting of a lead framework, over which may be stretched twenty-four layers of gauze, which is so shaped that it fits closely about the mouth and nose, and which may be retained in position by bands passed around the ears, thus giving the anesthetist the use of both hands.

The preparation of the patient implies, when this is practicable, an empty stomach, or at least one containing only liquids. When there is likely to be a large quantity of fluid in the stomach, this should be removed by the stomach-tube, since a patient may readily drown himself in his own vomit when profoundly anesthetized. Indeed, I have had this accident occur after an operation for internal strangulation and gangrene, though

the patient at the time had partly recovered from ether. It is scarcely necessary to state that any loose object in the mouth should be removed before giving the ether.

I have been in the habit for some time of immediately preceding the administration of ether by spraying the throat and nose with a solution of cocaine 2 per cent in adrenalin chloride 1 to 10,000. This greatly lessens the danger of cardiac and respiratory inhibition, which may cause death in the early stages of anesthesia, makes the nasal airway patulous, and so diminishes the secretion of mucus that the anesthetist is very little troubled by accumulations of this kind in the throat. This preliminary spray also does away with the sense of laryngeal constriction and suffocation, which to many patients is the most disagreeable part of an operation.

Whatever form of inhaler be employed, the administration should be gradual. For the first few inhalations the patient should be given a very attenuated vapor, the strength being gradually increased until it is evident that consciousness is lost, when it should be steadily and unremittingly pushed until complete relaxation is obtained. This end is best attained by so regulating the supply that it runs upon the inhaler in a series of drops just short of a steady stream, and this continued dropping should never cease, unless there be some complication, until anesthetization is accomplished. The simplest way to provide for this steady flow is by cutting two shallow grooves in the cork which is thrust into the opening of the quarter-pound ether can. This end may be more satisfactorily attained by having a dropping cork provided with two tubes of such caliber as to allow the ether to escape in the manner described.

The anesthetist should be provided with a mouth-gag and a tongue-retractor.

With few exceptions the difficulties he encounters will be due to mechanical obstruction of the respiration. This mechanical obstruction will be caused, in the early stages, by a rigid closure of the jaws and a thrusting of the tongue against the hard and soft palate, or its dropping back against the posterior pharyngeal wall. Even though it be impossible to open the jaws, the pharynx can be opened widely and the epiglottis lifted by extending the head upon the neck. This at once relieves the difficulty if the nasal passages are free. This, however, is rarely the case, since this muscular spasm occurs in fleshy, muscular, red-faced, drinking men, whose mucous membranes are all congested and juicy, and whose nasal passages are at best inadequate; when congested by ether, by the recumbent position, or moderate asphyxia, they become practically impervious. With such patients it is wise for the anesthetist to insert the mouth-gag at the beginning of anesthesia. Although I have never seen a patient die from this rigid asphyxia, the symptoms are often so alarming and the congestion so pronounced that in those with a weak vascular system the danger must be great.

A common cause of mechanical obstruction of the air-passages, particularly in children, is incident to an enormous secretion of mucus and saliva. This can be prevented by the preliminary use of adrenalin and cocaine. It can be helped by sponges, provided with long handles, by means of which the throat is repeatedly wiped out. Under some circumstances, when the fluid has been aspirated in the trachea, and in spite of drying the throat the symptoms of asphyxia persist, it is needful to allow the patient to partly recover from his anesthetization in order to clear his air-passages by a coughing action.

In profound anesthesia the air-passages may be mechanically blocked by the relaxed tongue dropping backward so that its base together with the epiglottis lies in close apposition to the postpharyngeal wall. This may be obviated by extending the head upon the neck. This motion does not, however, necessarily imply a free entrance of air into the larynx, since this very extension has a tendency to strap the soft palate over the base of the tongue, and thus to entirely prevent mouth breathing. The tongue may be freed from the soft palate by grasping its tip and pulling it well forward. It should be borne in mind that this traction upon the tip of the tongue has absolutely no effect upon its base; that though it will draw its dorsum from the soft palate, it will not affect the base of the tongue or the epiglottis in the slightest degree; and even when the traction is so powerful as

to tear out the thread passed through the tip of the tongue, the pharynx may still be occluded by the base of this organ. Hence, head extension and traction upon the tongue are both needful to insure a free passage of air through the mouth. When the tongue is particularly thick and fleshy, even traction upon its tip may fail to open the way between its dorsum and the soft palate. Under such circumstances the anesthetist should pass a finger well down toward the base, when by upward and forward traction the air-passage may be freed.

Dr. Hare and I some years ago demonstrated the effect of head extension upon the patulousness of the pharynx by removing a portion of the basilar process of the occipital bone, and inspecting the pharynx and larynx directly through this opening.

Cardiac and respiratory failure, from injudicious pushing of the anesthetic, often combined with shock, is best counteracted by hypodermic injections of cocaine, caffeine, and normal salt solution, employing in the latter 2 drachms of adrenalin chloride (1 to 1000) to the pint, and using a sufficient quantity to restore the vascular tonus. Absorption of this adrenalin chloride in normal salt solution should be hastened by vigorous massage, and when the emergency is great the adrenalin should be driven directly into the venous circulation, preferably diluted fifty times by normal salt solution, and injected into the external jugular vein. The stimulating effects of this drug upon the vasomotor centers, the heart itself, and the respiratory centers have been shown by Reichert and Crile.

The pancreas was removed from an etherized dog, and the anesthetic was pushed until the animal died. The chest was then opened, the heart exposed, and artificial respiration was begun. Seven minutes after complete cessation of all heart motion four cubic centimeters of a 1-to-10,000 solution of adrenalin chloride was injected into the external jugular vein, the pumping action of the heart being in the meantime produced by manual pressure—this for the purpose of carrying the adrenalin chloride to the right auricle. Within a few seconds of the injection the heart began to beat vigorously, the blood-pressure promptly jumped to normal, efforts at respiration were resumed some minutes later, and the dog would apparently have lived for hours had he not been killed, thirty minutes later, by bleeding.

In the asphyxia of ether administration I consider oxygen of doubtful use. I have never seen convincing evidence as to its efficacy, and I believe that attention devoted to the absolute freedom of the air-passages and the insurance of full respiratory movements is of far more moment than are efforts directed toward driving a small quantity of oxygen into the nose or pharynx.

As to the value of strychnine I have long been skeptical, and recent researches, particularly those of Reichert and Crile, seem to prove conclusively that it is not only without value, but it may be positively harmful.

The combination of nitrous oxide and ether I consider admirable. The patient goes under the influence of the gas in from one to two minutes without any distressing feelings beyond those incident to vertigo and roaring in the ears. The subsequent complete anesthesia by ether is materially hastened. I believe, however, that it is unwise to produce a condition of asphyxia by nitrous oxide and then to place closely to the patient's mouth and nose a cone saturated with ether. Moderate anesthesia by nitrous oxide and a pushing of the ether a little more rapidly than is allowable when ether alone is given seems to be an agreeable, safe, and efficient method of accomplishing surgical anesthesia.

As to the choice of an apparatus by which this combined method may be applied, I believe that one so provided with valves that one agent may be turned on as the other is turned off is undesirable since it is complicated. Each should be given separately. It is stated that nitrous oxide may be employed for prolonged operations, provided the surgeon mixes oxygen with his gas. I am not convinced that mixture with atmospheric air is not equally serviceable.

Recent statistics apparently demonstrate the complete safety of ethyl chloride for the performance of operations requiring but a few minutes. Because of the ease with which this agent is given, and the portability of the apparatus, it bids

fair to supplant nitrous oxide. The inhalation of the vapor causes no irritation to the throat, is not disagreeable, and anesthesia is accomplished in from thirty to forty seconds. Moreover, it lasts from two to seven minutes, and requires not more than from two to four cubic centimeters of the ethyl chloride. It is particularly important to procure a perfectly pure drug; ethyl chloride is affected by light. This agent has been used for the performance of operations requiring from thirty to sixty minutes, but such a large percentage of cases subsequently exhibit albumin in the urine that further statistics should be awaited before employing it in place of ether. When anesthesia is accomplished, the pupils are usually dilated and the pulse is likely to become extremely rapid. The patient comes out as rapidly as he goes in; there is usually no struggling in the beginning, no vomiting afterward, and indeed unpleasant sequelæ are almost as rare as in the case of nitrous oxide.

In regard to the choice of anesthetics I believe that nitrous oxide should be selected for brief operations because of its safety, and as a preliminary to ether because of the greater comfort experienced by the patient. Ethyl chloride has been proven sufficiently safe to justify its use for office operations, but judgment as to its safety and serviceability for prolonged operations must still be withheld.

Ether is the safest and most dependable anesthetic for major surgical procedures requiring complete relaxation and an expenditure of some time.

Chloroform may be used in brain surgery and in patients suffering from inflammatory lesions of the air-passages. It has been clearly shown that its irritating effects upon the kidneys are greater than those of ether.

POTASSIUM IODIDE IN MIGRAINE.

By J. R. Clemens, M.D.,
St. Louis, Mo.

Whether many cases of so-called migraine (for I have always doubted the entity of the symptom-complex that goes by that name) are syphilitic in origin or whether potassium iodide is a specific for the disorder I know not, but owing to an empiricism bred of despair I have lately been prescribing potassium iodide to the exclusion of all other drugs in cases of migrainous headaches, and my results have been so marvelous that I make bold to send you this paper on the subject in the hopes that some of your readers will test the efficacy of the drug I recommend, and thereby either confirm my statements and the claims of the drug to rank amongst specifics or silence me.

I was first led to exhibit potassium iodide for two reasons:

1. The great similarity that exists between migraine and cerebral syphilis, the headache of both being characterized by pain that is deep seated, constricted, and hammering, localized or diffuse, of great intensity, with nocturnal exacerbations, long durations, and relapses; also insomnia.

2. The raised arterial tension.

It was only after I had exhausted all other resources that in despair I came to examine closely into the nature of the headache, casting aside the trammels of authority and precedent, with the result that heightened pulse tension and the similarity of the syphilitic and migrainous headaches attracted my attention. Distrusting my bias against the belief in migraine as an entity in itself, I first attempted to reduce pulse tension with potassium nitrate and nitrite, together with sodium nitrite, but without making any impressions on the headache. With the exhibition of potassium iodide (gr. v-x) thrice daily, the headache rapidly diminished both in intensity and in frequency, and after a two or three weeks' course of potassium iodide it was absolutely eradicated. A significant point in treatment is that the headache can be recalled at will by simply discontinuing the drug for a few days. In some of my cases, with a history of lifelong martyrdom, the effect has been not only miraculous but, relatively speaking, almost instantaneous. Recitation of cases would serve no useful purpose, as I make a broad assertion that will cover all kinds and conditions of migraine when I say I have not yet met a case since beginning the use of potassium iodide that was not absolutely cured, and my experience has been somewhat extended.

A point of interest in the life history of

migraine, that of the disappearance of the migraine with advancing years, can be easily explained on other grounds than those that simply ascribe it to an attribute or rather a characteristic of a mysterious disease.

One of the prolific causes of migraine is eye-strain. Now with the advent of old age presbyopia makes its appearance, and either the myopic becomes less myopic, or the aid of an oculist is sought, with the result that errors of refraction are corrected and the headache of eye-strain disappears. Another reason for its disappearance in elderly people is the fact that the dentist's aid is also sought; and another still, abstemiousness and avoidance of excess. In those cases of eye-strain and migraine due to nebulæ from old corneal ulcers or interstitial keratitis, I have yet to learn that thiosinamine is more efficacious than potassium iodide in bringing about absorption of adventitious tissue.

ON THE THERAPEUTIC VALUE OF THE NUCLEIN COMPOUNDS.

By James Burnet, M.A., M.D. (Edin.), M.R.C.P. (Edin.),
Edinburgh, Scotland.

Nuclein, as is well known to every student of chemistry, is a complex substance which is composed of various elements, including phosphorus. The most important ingredient, however, in its composition is nucleinic acid. The latter is a very powerful antiseptic agent, promoting leucocytosis whenever it is brought into contact with living tissues. Nuclein has been used with considerable success in the treatment of tuberculosis and other infectious diseases, as well as locally in abscesses and ulcers. We are not now, however, concerned with the therapeutic action of nuclein. This short paper is intended more to direct attention to compounds of nuclein with certain metallic substances.

The first nuclein compound to which I shall refer is mercurol, partly because it is one of the oldest and most tried, and partly also because its sphere of usefulness is more varied than that of the others. It has been used with marked benefit in otitis media, corneal ulcers, conjunctivitis, urethritis, cystitis, and other allied conditions. Personally I have used it with marked success in cystitis. The bladder was washed out regularly with a one-per-cent solution, freshly prepared on each occasion. In every instance success attended its use. In middle-ear diseases I have used mercurol solution in syringing, and have found that it acts beneficially upon the purulent discharge. In one of my cases where pus had been present for some months, in a child who developed middle-ear disease after scarlet fever, mercurol solution arrested the discharge in a few weeks. When corrosive sublimate solutions are employed in such conditions we usually find considerable irritation results. This is not the case with mercurol, the presence of nucleinic acid admitting of its being used in solutions of considerable strength.

Cuprol is a true chemical compound of copper and nucleinic acid. It contains about six per cent of the metal, and occurs as a greenish powder. Its action is mainly that of an astringent. Personally I have applied it to chronic ulcers in order to promote healing. Those who have employed sulphate of copper for this purpose are well aware of the considerable pain which this salt produces when applied to any raw surface. Cuprol rarely produces pain, but merely, in some cases, slight momentary discomfort. A six-per-cent solution painted over unhealthy granulation tissue will be found excellent in promoting healing of the parts. In marginal blepharitis a ten-per-cent solution painted on the lids reduces the inflammation very rapidly, at the same time relieving the pain and itching which are present in such cases. In conjunctivitis a ten-per-cent solution will be found of great service. When this solution is brought in contact with the inflamed surface slight smarting is produced, but as this never lasts more than a quarter of an hour, this cannot be said to be any drawback to its use. I have made use of this remedy in various conditions where an astringent effect was desired, and have been not a little surprised at the total absence of discomfort which is usually associated with its use.

I must now refer to another compound of nuclein, viz., nargol. This is composed of nucleinic acid and silver in the proportion of ten per cent. This new compound has a wide range of usefulness.

Personally I have used it in gonorrhea as an injection in strengths varying from one to three per cent. In no case have I observed any irritation result from its use in these strengths. Nargol seems to have a penetrating effect upon the tissues to which it is applied. In gonorrhea the discharge soon ceases after its systematic use. In chronic laryngitis great benefit results from the employment of nargol as a pigment to the inflamed area. It is certainly preferable to metallic silver solutions in throat affections.

Ferrinol is the last of these compounds to which I shall refer. It contains about six per cent of iron, and occurs in the form of a brown powder. It is not acted upon by the gastric juice, and is absorbed entirely by the small intestine. It has therefore distinct advantages over the ordinary metallic preparations of iron, which frequently produce gastrointestinal irritation. It is perhaps most readily taken in the form of chocolate-coated tablets in doses of three to five grains thrice daily.

With regard to all these compounds it may be well to point out that they are very readily soluble in water. It is best to use them freshly prepared. This is especially to be noted in the case of mercurol, which readily decomposes in solution. Mercurol does not coagulate albumin, and hence it differs very markedly from corrosive sublimate, which readily does so. All these compounds possess the property of penetrating deeply into the tissues with which they are brought into contact, and consequently their action is more powerful than the ordinary metallic salts, while at the same time they produce much less irritation.

EXPERIMENTAL INVESTIGATIONS ON THE NATURE OF CIRCULATORY DISTURBANCES IN THE COLLAPSE OF ACUTE INFECTIOUS DISEASES.

PAESSLER and ROLLY, of Leipsic, report a series of experiments made upon animals with diphtheria toxin and bouillon cultures of pneumococci, as a result of which they are convinced that circulatory disturbances occurring in the course of diphtheria, pneumonia, and other acute infectious diseases are exclusively dependent upon vasomotor paralysis. The toxin of diphtheria produces a secondary weakness of the heart, but it can be prevented for a considerable time if the results of vasomotor paralysis be counteracted by compression and intravenous injection of normal saline solution. The investigators believe that the heart's lessened power of resistance is a functional expression of the parenchymatous degeneration of the heart muscle which is seen in individuals who have died from diphtheria, and they think that the occurrence of this degeneration proves the heart muscle to be exceedingly susceptible to any influence which injures it even in the slightest degree. In pneumococcus poisoning the functional capacity of the heart was found to be much greater than in diphtheria, and only a transitory insufficiency followed periods of asphyxiation lasting from two to four minutes. No direct injury to the heart could be determined, and post-mortem examination failed to reveal the presence of parenchymatous or fatty degeneration.—*Münchener medicinische Wochenschrift*, Oct. 21, 1902.

THE ACID TREATMENT OF PRURITUS.

LEO in the *Therapeutische Monatshefte* for November, 1902, reports the case of a man, aged twenty-five years, who had suffered a year with an excruciating general pruritus, the cause of which could not be elicited by careful examination, the patient being strong and well nourished. His urine was strongly alkaline and contained an excess of earthy phosphates. Leo thought that the alkalinity of the urine might represent an increased alkalinity of the blood upon which the pruritus might depend, so he placed the patient upon hydrochloric acid, which soon reduced the turbidity of the urine but did not cause a change in reaction, although the pruritus was somewhat lessened. Then sulphuric acid was administered in ascending doses until the urine became acid. The pruritus decreased constantly, and disappeared entirely upon the eighth day. Leo has obtained good results by the use of sulphuric acid in three cases of pruritus in which the urine was not alkaline. He attributed the benefit to lessened alkalinity of the blood produced by the acid, which he deems worthy of trust in all obscure cases.

The Therapeutic Gazette

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Leading Articles.

SOME POINTS IN REGARD TO THE TREATMENT OF SHOCK AND COLLAPSE.

We have in an earlier issue called attention to reports made by Crile of the results which he has obtained in studying these two important conditions, and we have more recently read with much interest the contribution to this subject which he has published in the *Boston Medical and Surgical Journal* of March 5, 1903. Our interest has been aroused not only by reason of the importance of the conditions of which we are writing, but also because so little work of an experimental character in relation to the physiology of various pathological conditions is being done by those surgeons who have the largest opportunities for observation.

There are several points in Dr. Crile's paper which we think are somewhat open to criticism, at least when he attempts to apply the results and conclusions at which he has arrived from experiments upon animals to surgical conditions in mankind. On the other hand, we are glad to find that in a number of instances his experimental results thoroughly indorse the recommendations which we have previously made in these columns. For example, several months ago we pointed out that if adrenalin was to be employed for its general effect upon the system it ought to be administered in small doses very frequently repeated, in order to approximate as closely as possible the method by which the suprarenal glands in life supply the tissues with their secretion. Crile's observations emphasize this point, and he expresses the belief that the adrenalin should be administered in saline solution, and that it should be given by means of a burette, a minute dose being introduced into the body quite frequently. Another point which we are glad to see him emphasize is the fact that strychnine if given in abnormal amount produces harmful effects upon the circulation. We have long been of this opinion, and have more than once emphasized it in these editorial columns. We do not find ourselves able to agree with Dr. Crile that strychnine in any effective dose is practically always harmful, and while it may be true, as he asserts, that therapeutic doses, in his experience, produce no effect, and that poisonous doses do far more harm than good, we do not think that his conclusions can stand as a guide to the use of this drug in human beings, in view of the excellent results which are obtained by innumerable physicians and surgeons who regard strychnine as a valuable stimulant after or during operative procedures.

While, therefore, we think that Dr. Crile's statement that strychnine does harm is a useful one in that it emphasizes the necessity of caution in the use of this drug, we still believe that strychnine may be employed in the conditions in which it is so commonly used with advantage. It may be perfectly true, as Dr. Crile asserts, that it is not in moderate dose a real vasomotor stimulant, but it may be considered to act upon the general system as a stimulant, irritant, or whip, increasing nervous activity, and so indirectly at least improving the circulatory condition. We all know that caffeine cannot be considered a direct circulatory

stimulant, yet on the other hand its general influence upon the system is that of a stimulant, and whether it acts directly or indirectly, it certainly produces good results in many patients who have failing circulation.

We are very heartily in accord with Dr. Crile's statement that the control of the blood-pressure is synonymous with the control of life itself, and that surgical shock is an exhaustion of the vasomotor center, neither the heart muscle, the cardio-inhibitory center, the cardioaccelerator center, nor the respiratory center are other than secondarily involved. There can be no doubt whatever that most patients who die shortly after a severe injury or operation lose their lives as a result of vascular collapse rather than as the result of heart failure. Dr. Crile thinks that there is a difference between shock and collapse, the difference being rather in degree than in kind, and thinks in shock the vasomotor paralysis is so complete that stimulants are useless or almost useless, whereas in collapse the centers are not completely exhausted, and stimulants may therefore be of value. The difference, then, between the action of the stimulants which we are accustomed to employ in the treatment of the conditions under discussion and the influence of the new drug, adrenalin, may be summed up in the following language:

If the shock to the vasomotor center has been so great as to paralyze it, the more old-fashioned and much-relied-upon stimulants can do no good because the center upon which they act is paralyzed, and therefore cannot send impulses to the blood-vessels which will restore their tone. Whereas the administration of adrenalin, which acts upon the heart and blood-vessels, independently of the vasomotor center, may restore and maintain to some degree a normal arterial pressure, even if the vasomotor center is too depressed to irradiate impulses.

The issue of the *Boston Medical and Surgical Journal* of March 12 comments editorially upon Dr. Crile's paper, and after according him his full meed of praise for his enthusiasm and originality, points out that the phenomena of shock, which he has studied in the laboratory, and the methods for controlling the blood-pressure which he has used, are all on what might be called an exaggerated scale, and while they have some bearing upon human medicine and surgery, cannot be considered as being capable of direct application in every detail.

DIAGNOSIS AND THERAPEUTICS.

That accurate diagnosis is absolutely essential for successful therapeutics will not be denied, yet very frequently physicians, when unable to decide to their own satisfaction that a patient is suffering from a given malady, prescribe remedies with the hope that good will result, and that in this way a therapeutic test and diagnostic aid can be obtained. This method of treatment is, however, irrational, unscientific, and quite as capable of producing evil results as of causing good ones, and further than this, tends to make the physician careless in making accurate examinations of the patient, and so leads him very frequently to the administration of remedies which can by no possible chance exert any influence upon the pathological process which is present.

Our attention is once more called to this subject by an interesting, but brief, article from the pen of Sir Frederick Treves, of London, upon the mimicry of gastric diseases by pathological conditions in other parts of the body. In this article he well points out how frequently disease of the spine in its early stages may cause complaint on the part of a patient of pain in the epigastrium, the cause of which will not be revealed by the most careful abdominal examination, although should the vertebræ be examined, the underlying factor at once becomes manifest. This condition may not only occur in children, who are very apt to refer to all pains in the body as being gastric in character, but they also take place in adults; and Treves cites two very interesting cases in which this was true.

One of them was a woman of forty-five years, a chronic dyspeptic and neurasthenic, who had been through all sorts of dietetic and other treatment for the relief of certain severe gastric symptoms, which were so marked that they have finally driven her to asking for operative procedure, and the performance of a gastroen-

terostomy. An examination of her back revealed Pott's disease, and the gastric pain and sickness disappeared after a long confinement to bed in a recumbent position, so that the back was benefited. In still another instance, a man of fifty years, who suffered from violent pain in the stomach after food, and whose chief complaint was of this pain and increasing weakness, actually came to operation because of the symptoms which seemed to be centered in the neighborhood of his pylorus. Abdominal section, which was performed after examination under an anesthetic had been fruitless, revealed nothing, not even adhesions. The patient recovered from the operation, and a few days afterward the nurse on changing the patient's position in bed called attention to a lump in his back, which proved to be a sarcoma growing from the dorsal region of the spine. Paraplegia speedily developed, and the patient died within a month, Treves believing that all his symptoms were really due to this morbid growth, which by pressing on nerve trunks caused abdominal pain.

FICTITIOUS DRUGS.

We called attention in these columns some months ago to the very rational criticisms of the new arsenical preparations known as cacodylates made by Sir Thomas Fraser, the Professor of Materia Medica in the University of Edinburgh, and pointed out how impossible it was for these combinations of cacodylic acid to produce anything like the satisfactory therapeutic results which necessarily follow the use of the more old-fashioned arsenical preparations which are official in every pharmacopœia. Since the cacodylates have been largely employed several complaints have been made that they give a garlicky odor to the breath, and that they irritate the stomach at times, and this has caused the introduction by Gautier of a preparation which he called arrhénal, which is technically di-sodic-methyl-arsenate. He claims that this colorless crystalline salt, which is readily dissolved by water and alcohol, can be employed with advantage as a substitute for the ordinary preparations of arsenic, and that it produces none of the irritating effects sometimes easily aroused in susceptible individuals. Professor Fraser clearly shows that this substance likewise, while theoretically of value, is practically largely inert both upon the ground that it is a stable compound of arsenic, which is with difficulty broken up in the system, and also because actual clinical experiment, scientifically carried out, fails to shows that it possesses any real or extraordinary value. Thus, in the case of a woman sixty years of age, suffering from chronic eczema, he gave ascending doses of arrhénal for a period of over forty-three days. Altogether she took over 207 grains of it, which is equivalent to 70.5 grains of arsenic, to 93.06 of arsenous acid, or 10,237 minims of liquor arsenicalis; or, to use Professor Fraser's method of expressing these facts, she received a sufficient quantity of arsenic to kill forty-five adult human beings if the arsenic had been in the form of any of the older therapeutic compounds. Her daily dose was equivalent to about 440 minims of liquor arsenicalis for over twenty-five days, and yet this large introduction of arsenic did not produce any toxic symptoms, and no appreciable therapeutic influence was manifest. Another case of the same character is reported in which a child suffering from chorea received large doses of arrhénal without benefit, but who was nevertheless rapidly benefited as soon as she was placed on liquor arsenicalis. It is well for physicians therefore to investigate the claims and possibilities of new drugs before they rely upon them as substitutes for old ones.

TRUE FOOD VALUES.

Not long since we pointed out the fact that many members of the profession are entirely too ready to accept the "say-so" of the purveyor of medicines and foodstuffs as to their exact therapeutic value. Not infrequently the physician is called upon by an individual, who lauds to the skies a new medicinal preparation, but is soon proved to know little about it if he is cross-questioned intelligently. We believe that this is particularly apt to be the case in regard to foods for the sick. There are a very large number of these so-called

nutritious substances on the market, and some of them undoubtedly possess great value. But on the other hand, it is by no means an uncommon thing to find a patient endeavoring, under the advice of his physician, to subsist on some one of these liquid preparations without the ingestion of a sufficient amount of real food to support the needs of the system.

An article which has appeared in the *Boston Medical and Surgical Journal* of March 12 by Dr. Harrington illustrates very clearly the exact value of some of these preparations. He shows that most of them contain a far larger quantity of alcohol than of nutritive material. Thus, the quantity of alcohol by volume ranged from about 14 to 23 per cent, as compared to from 6 to 19 per cent of solids, and therefore the administration of full doses of these preparations results in the free use of alcohol and in the administration of small quantities of actual nourishment; or in other words, in stimulants rather than in nutrition. Our object in calling attention to this investigation of Dr. Harrington's is in no way to throw discredit or doubt upon the value of these preparations in medicine. The practical points to be drawn from this research seem to us to consist in the fact already mentioned, that these various liquid nutritive products do not contain, on the one hand, sufficient nourishment to really support the patient, and on the other hand do contain so much alcohol that they will be strongly contraindicated in those cases in which alcohol is considered undesirable.

RESECTION OF THE THORACIC ESOPHAGUS.

Even in these days of major surgical operations the resection of the thoracic part of the esophagus, in the hope of radically curing a patient afflicted with malignant disease of this portion of the alimentary canal, strikes the professional mind as a procedure which denotes rather boldness on the part of the operator than good judgment and a desire to lessen suffering and prolong life. In this case the operation was performed by Faure. The patient was fifty-two years old, and because of malignant stricture of the esophagus had been subjected to gastrostomy. Although greatly emaciated he exhibited so much vitality that Faure considered that an attempt at radical cure was justifiable. He made his first incision along the internal border of the sternomastoid muscle four inches in length, running upward from just above the sternoclavicular articulation. The muscle and the large vessels were retracted outward, and the trachea was freed below the thyroid body. By blunt dissection this was separated from the esophagus, and the latter was then loosened from the vertebral bodies, and was surrounded at the point where it entered the thorax by two silk threads, so that it might be ligated and cut between these ligatures, in case the thoracic incision enabled the operator to reach the malignant growth. The patient was then turned on his left side, and a long cut was made running midway between the dorsal and lateral vertebral processes. Two inches of the sixth, fifth, fourth, third and second ribs were resected, and one inch of the first rib. As soon as the latter was divided, the shoulder fell forward and had to be held in place by an assistant. It was then easy to separate the pleura from the vertebral column and reach the mediastinum. The tumor was a cancer placed just behind the lower portion of the trachea and the bifurcation of the bronchi. It was easily separated from the surrounding parts, exhibiting no adhesions. The two ligatures placed about the esophagus in its lower cervical portion were then tied, and the esophagus was divided between them by the thermocautery. By making traction upon the lower suture the thoracic portion of the esophagus was stretched, and was then readily separated from the vertebral column and from the lower portion of the trachea and bronchi. One inch below the point of infiltration the esophagus was cut between two ligatures. The operation lasted an hour and a half. The patient died shortly after, "without," as the reporter somewhat naively states, "any cause being found on autopsy to account for the fatal issue." He also states that Faure performed a similar operation on another patient with the same result, the patient perishing of a progressive weakness in twenty-four hours without hemor-

rhage or immediate shock; the respiration, however, being seriously affected and the pulse becoming a running one.

Demoulin, after a résumé of the various methods which have been suggested for reaching the esophagus, states that Faure was the first who has been able to extirpate a cancer which has involved the thoracic portion of this canal. Death was attributed to nerve trauma in both cases.

It may be that by the use of adrenalin chloride systematically in the form of hypodermoclysis, and the employment of cocaine locally for the purpose of producing a physiological block, such formidable procedures may be successfully carried out in the early stages of esophageal carcinoma before infiltration has become widespread. The justification lies in the absolute hopelessness of these cases by any other form of treatment, though the use of the *x*-ray has in some instances been followed by such a symptomatic betterment that the effect of this agent should always be tried.

INFECTIVE ARTHRITIS.

The relation between infection and arthritis, at one time considered remote, except in tuberculosis, syphilis, and acute sepsis, is now so well recognized that the general practitioner is prepared to accept the statement made by Marsh (*Lancet*, Dec. 13, 1902), to the effect that the great majority of specific diseases are liable to joint infection.

It is, however, also well known that certain organisms, aside from those classed as simply pyogenic, and particularly the pneumococcus, may apparently cause a primary joint infection in the absence of the ordinary symptoms of systemic involvement. Thus Cave, in his collection of cases of pneumococcic arthritis, notes that in the majority of his cases this complication developed in from two to fifteen days from the onset of acute pneumonia. In two cases, however, the arthritis preceded the pneumonia, and in three cases occurred independent of this inflammation. In the large majority of cases suppuration occurred, and seventy-five per cent terminated fatally, due, no doubt, to the fact that the pneumococcus produces a profound septicemia in addition to its local manifestations.

Typhoid arthritis may appear at the commencement of the illness, closely simulating in its manifestations rheumatic arthritis, and disappearing in a few days.

The septic arthritis, which occurs in typhoid fever, is in reality due to poisoning with the ordinary pus germs. The typhoid arthritis proper may appear during the acute or subsiding stage of the fever, or may not manifest itself till the period of convalescence. It may be monarticular or polyarticular. It may subside, may cause ankylosis, or may terminate in suppuration and complete destruction of the joint. In the monarticular form the hip is commonly involved and may result in a chronic serous effusion, followed by luxation or resolution or tough fibrous ankylosis. There is reason to suppose that the inflammation is due to the local action of the typhoid bacillus.

The scarlet fever arthritis in one form exactly simulates acute rheumatism, and usually subsides in a few days. The other forms are true septic arthritis due to mixed infection.

Influenza arthritis has been reported, and corresponds in type and symptomatology with the arthritis complicating gonorrhea. Erysipelas is also attended by an arthritis, which, as in the case of the other infective diseases, may appear as a transitory synovitis, a plastic involvement of the whole joint and its capsule, or a complete destructive suppuration of all the structures.

Marsh classes the joint inflammations due to rheumatism with the cases of infective arthritis, and very justly so. He passes over this important subject very briefly, alluding to the diplococcus described by Treloubet, and Singer's contention that the joint manifestations of rheumatism are due to the streptococcus or the staphylococcus.

Allusion is made to the infective arthritis complicating tonsillitis. Indeed, any superficial or deep infection may be complicated by joint inflammation. The acute arthritis of infants, due in reality to an infective myelitis breaking into the joint cavity, is also described.

As to prognosis and treatment, the type of infective arthritis characterized by a

limited effusion usually recovers promptly and completely under splinting and hot fomentations.

In the second group of cases, in which the joint cavity is widely distended with fluid, whether this effusion be secondary to gonorrhea, typhoid fever, pneumonia, to grippe or rheumatism, or be without ascertainable cause, the tension should be relieved, and the joint should be freely irrigated either with carbolic lotion 1 to 100, or with biniodide of mercury 1 to 1000. The fluid is best evacuated, according to Lockwood, by a full-sized hydrocele trocar and cannula, the irrigation being performed through the latter. If the fluid proves to be already purulent, the joint must be freely opened, the finger introduced to break down adhesions which may have formed, and behind which pus may find imprisonment, and thorough irrigation must be carried out. There are many cases to show that even when suppuration is well advanced, such treatment will result in an immediate improvement, and if the patient survives, in complete recovery with retention of absolutely every movement of the joint.

In the plastic form of arthritis the prognosis is unfavorable. The disease, in spite of treatment, is exhausting and persistent. A large amount of new fibrous tissue is developed between the articular surfaces, and the periarticular tissues of the joints are densely infiltrated, and converted into a huge scar, so that firm fibrous ankylosis, which may subsequently become bony, results. There are no means by which this may be prevented. Rest, hot fomentations, small blisters, and later massage, will be found useful. Forcible manipulation, even after the subsidence of the acute symptoms, is usually hurtful.

In the cases characterized by a rapid septic destruction of the entire joint, the prognosis is most grave.

A grouping of the cases of infective arthritis is instructive, since it shows that they all conform to a general type, and are amenable to practically the same treatment. It is particularly important since it accentuates the fact but little recognized that many cases of rheumatic arthritis should be regarded as surgical rather than medical affections, and should be subject to surgical treatment.

Reports on Therapeutic Progress

FAVORITE DRUGS AND FORMULÆ.

An article by LITTLE in the *Brooklyn Medical Journal* for January, 1903, deals with homely but useful points, as follows. He reminds us that castor oil needs no recommendation as to its value in pediatric work. Most children take it well; where they do not the following formula is acceptable:

℞ Ol. ricini,
Glycerinæ, āā f℥j;
Ol. gaultheriæ, min. x.

M. Sig.: A teaspoonful to a tablespoonful according to age. Shake well.

The addition of the oil of wintergreen and the glycerin makes the mixture very palatable, and the latter assists the oil in its action.

If called upon to exhibit the sulphate of magnesia, which is usually objectionable to a child, not to mention an adult, he thinks that the very unpleasant taste may be fairly concealed by syrup of raspberry, as

℞ Magnesiæ sulphat., ℥iv;
Syr. rubi idæi, q. s. f℥ij.

Dose: A tablespoonful, which represents one drachm of magnesia.

When there is cough due to bronchitis and not to an irritated stomach, the following, while an old formula, is efficacious, when an expectorant is indicated:

℞ Ammonii chloridi, ℥ss;
Mist. glycyrrhizæ co., f℥ij.

M. Sig.: Half teaspoonful to a teaspoonful every two or three hours, according to age. Shake well.

The above seems preferable to most of the syrupy mixtures, and like calomel it has proven itself in high favor with mothers—the "children even cry for it." Should a syrupy mixture be called for, especially one in which codeine is to be used and its taste concealed, the vehicle may well be composed of syrup of tolu 1 part, syrup of raspberry 1 part, and water 2 parts.

The results in the administration of cod-liver oil, with all of us a great favorite, are largely dependent upon the ability of the child to assimilate it. The author has believed it wise to use a pancreatized emulsion—the action of the ferment so

subdividing the globules of oil that there is smaller tax upon the digestive organs.

Cod-liver oil in combination with one of the malt solutions has a good nourishing value, and through its sweet taste may be used in older children where the gustatory nerves rule the patient.

Besides having value as a mild laxative and tonic for babies, olive oil may be found of service in dysentery, in severe diarrhea, and in chronic catarrhal gastritis. In the first two indications the author is accustomed to employ it when the acute symptoms are checked, but there remains an irritated condition of the bowel. It is given in doses of a teaspoonful to a tablespoonful three times a day, and apparently has a very soothing effect as well as tonic properties.

In any of the diseases of children where there is much loss of flesh and strength, and where oils by the stomach are contraindicated, the routine practice of employing cod-liver or olive oil inunctions seems desirable.

The bromides, being the mildest sedatives, are justly popular with Little. He is in the habit of combining the potassium, sodium, and ammonium salts in equal parts. When given well diluted with Vichy or Seltzer, the unpleasant salty taste is disguised.

In the average case of eczema in babies, where moderate stimulation of the skin is required, the following formula recommended by Starr seems to act well:

℞ Zinci oxidi, ʒij;
Ungt. picis liquidæ,
Ungt. aquæ rosæ, āā ʒss;
Lanolin, ʒj.

PASTEURIZED AND STERILIZED MILK AS A CAUSE OF RICKETS AND SCURVY.

To the *Medical Record* of December 27, 1902, SILL contributes a valuable practical paper on this most important subject, and takes excellent ground in urging the proper use of cow's milk. He thinks that as comparatively little has been written on this subject it may be of interest to the profession to hear the results obtained from feeding infants on the heretofore much-lauded sterilized and pasteurized milk.

The author has taken a hundred and seventy-nine consecutive cases which have been fed during a period of from three to eighteen months, pasteurized milk being given for nine months of the year, while during the three summer months sterilized milk was given.

These observations have been made in a large dispensary where there is a well equipped milk laboratory, and where, during nine months of the year, the milk has been pasteurized, and during the three summer months sterilized. It is all carefully modified to suit the age and condition of each child, and every precaution has been taken to make the bottles absolutely clean and sterile before using. These bottles with pasteurized milk are given out each day by competent nurses.

The author has examined the children so fed with the utmost care, and has found in 97 per cent of the cases unmistakable signs of rickets or scurvy, most of the cases being rickets or a combination of rickets and scurvy, the one merging into the other. About forty of these children had from five to seven feedings of the sterilized or pasteurized milk, according to the time of year, each day, supplemented by breast feedings. These all had signs and symptoms of rickets, although not so marked as in those who were fed exclusively on pasteurized or sterilized milk.

The changes which were most frequent were beading of the ribs, pot belly, sweating about the head, flabby muscles, craniotabes, and restlessness at night. The later changes were, in addition to those already enumerated, large, square head, enlarged epiphyses, delay in the eruption of the teeth, constipation or diarrhea, malnutrition, bow-legs, kyphoses, chicken-breast, horizontal ring, and open fontanels.

An infant food must take the place of and simulate mother's milk to be an ideal food, and in order to do this it must be of animal origin; it must not be heated above blood heat, as a temperature much above that disorganizes the albuminoids and the mineral constituents; it must contain all the ingredients of mother's milk in the same proportions; it must contain no ingredients not found in mother's milk.

The aim of sterilization and pasteuriza-

tion of milk has been to destroy disease germs, and preserve it—that is, to keep it from turning sour.

Uncontaminated milk is necessary, we admit, for successful infant feeding, but contaminated milk, no matter how carefully modified and pasteurized, will cause disordered digestion and improper assimilation in the young child.

Sterilization or pasteurization of milk makes it a dead, preserved food. Mother's milk, on the contrary, is a live, fresh food.

Winters says: "I have seen scurvy where pasteurized, modified milk had been the only food. Recovery was rapid with the continued use of the same food raw." Again he says: "Fresh, pure milk is not improved by pasteurization; it is not more digestible, and it is in no way a better food for an infant."

Sterilized or pasteurized milk is to the infant what canned or salt food is to the sailor.

It is unnecessary to pasteurize milk to destroy disease germs when a pure milk supply is provided for, and this can be practically done by having the herd frequently subjected to the tuberculin test to exclude tuberculous cows. The cows must be groomed, the teats and udders and the milkman's hands thoroughly washed and dried before milking. The milkman should wear clean, washable clothes, and the milking should be done in a building away from the stables.

The milk should be received into sterilized quart bottles, which are then tightly sealed, labeled with the dairyman's name, and the date, and cooled immediately to a temperature of 40° Fahr.

Experiments which have been made at the Yale University Agricultural Experiment Station show that when milk is cooled to 40° F. all bacterial growth is at once arrested, and continues so long as the milk is kept at that temperature. Milk has been kept sweet in this way for several weeks.

In conclusion the author states that cow's milk is generally acknowledged to be the best substitute for mother's milk, when properly prepared, but cow's milk is not bettered by sterilization or pasteurization; on the contrary, this treatment undoubtedly makes it the direct cause of rickets and scurvy and kindred diseases in children.

The object of pasteurization can be safely accomplished, in the opinion of the writer, by the above described care of the milk. It therefore appears that this subject warrants a more careful investigation by the profession, as it is a vital question in New York City, since hundreds of infants are being fed on sterilized or pasteurized milk.

ERGOT IN HEMORRHAGE OF OTHER THAN UTERINE ORIGIN.

The late Dr. FENN prepared a paper on this topic which is published in *American Medicine* of December 27, 1902. Toward its close, and before he tells how he viewed this subject, and after quoting conflicting views of various authors, he asks: Because doctors of equal experience and acuteness disagree, must we conclude that all are therapeutic humbugs or the victims of a biased imagination? Not necessarily. The discrepancy is no greater than has existed in regard to several other drugs whose action is well known and is susceptible of determination in the laboratory. When such differences of opinion exist, several forces are, as a rule, to be found at work, and among them the following:

1. The strength of preconceived expectations.

2. The varied degree of development of the critical and judicial elements in different men.

3. The well known difficulty of determining the action of any drug and of separating its effect from that of the *vis medicatrix naturæ* in certain internal difficulties.

4. The confusion of two or more conditions under the same name.

5. The failure to study carefully the proved physiological action of the drug in question.

All of these elements are of more or less influence in determining the current valuation of ergot as a pulmonary styptic. Again, because the drug has been found to be of undoubted value in uterine hemorrhage, the idea has been formulated that it must be equally valuable in other forms, without considering the essential differ-

ence in conditions or its mode of action. This idea once promulgated, it has naturally followed that a certain class of practitioners in whom the critical faculty is slightly developed has accepted the dictum "administer the drug and consider the results consequential as a matter of course." Examples of just such faulty clinical observation and conclusion could be given by the hundred.

The author knows of no condition in which it is more difficult to distinguish the *post hoc* from the *propter hoc* than in the treatment of internal hemorrhage. Some hemorrhages take the form of an oozing, scarcely staining the sputum. They may continue a day or week; they may stop at any time, regardless of the potions poured into the long-suffering stomach. Others may come in profuse outbursts of fresh blood, and these also may continue or cease when nature wills. The last drug employed usually gets the credit due to the processes of nature. Moreover, hemorrhage may be venous, capillary, or arterial, and it may come from a simple congestion or from the rupture of a large artery. Is it reasonable to expect the same drug to act in the same way in all cases? Might not a remedy which would check capillary oozing increase the jets from a ruptured artery? It is at least possible. Yet Osler is the only one of the writers quoted who emphasizes this distinction, and he does not apply the point definitely in speaking of the drug treatment.

The physiological action of ergot is, in its essentials, agreed upon by all modern writers. The two points which concern us are that it stimulates the vasomotor nerves and contracts involuntary muscle fibers everywhere in the body, as a result contracting the capillaries and arterioles and raising the blood-pressure in both the general and pulmonary circulations. It stops hemorrhage from the uterus by powerfully contracting this great mass of involuntary muscle, and closing, by pressure, the blood outlets in spite of the increased pressure in the vessels. Can we expect the same result elsewhere? Possibly, if the bleeding is from veins or capillaries; certainly not, if from a broken artery. F. J. Smith, of the London Hospital, in a recent article, strikes at the root of the whole matter when he comes to the conclusion that the ordinary indiscriminate use of ergot is quite as capable of harm as of good. He considers ergot of value in venous and capillary hemorrhage, and harmful in arterial hemorrhage, on the theoretical grounds mentioned above.

The author's conclusions are as follows:

1. In profuse hemorrhage from the lungs, appearing in mouthfuls, the likelihood exists that an artery of considerable size is ruptured or eroded, and our object should be to quiet the circulation and lower the blood-pressure. We should use rest and such drugs as aconite. Under such circumstances ergot should never be given.

2. In slow oozing the source of the bleeding is usually the congested capillaries in the mucous membrane. Ergot may stop the bleeding by constricting these capillaries; but as such hemorrhage is usually decidedly beneficial and stops when the congestion is relieved, and as ergot is not well borne by the stomach and is decidedly disagreeable to take, the use is also here rather contraindicated than otherwise. Digitalis, which also contracts the capillaries, would be quite as useful, and it is asserted that Trudeau, at Saranac Lake, uses the drug for this purpose.

3. Uterine hemorrhage seems to furnish the preëminent, and perhaps the only, indication of ergot as an internal styptic.

FIVE HUNDRED CASES OF CHLOROFORM ANESTHESIA IN GYNECOLOGICAL PRACTICE.

EVELT, of Munich, reports five hundred cases of chloroform anesthesia without any deaths. The patients are given no food after the evening of the day preceding the operation, the bowels are emptied with castor oil, and 0.01 of morphine hydrochlorate is given hypodermically one-half hour before the operation. The technique of administration is as follows: A Schimmelbusch mask is held a hand's breadth above the face, and chloroform is allowed to drop upon it at the rate of twenty drops a minute. After two or three minutes it is placed upon the face, and the chloroform is continued at the rate of twenty drops a minute until the pupils contract and fail to react to light.

Then the drug is suspended, but the mask is left upon the face, enough chloroform being inhaled from it to keep the patient under for some time. As soon as the pupils begin to dilate, enough chloroform is given to cause them to contract again, and this procedure is kept up throughout the operation. Evelt places no reliance upon the corneal reflex. He thinks retching is best controlled by careful continued administration of the anesthetic. He uses the hooked tongue forceps in all cases. If the after-effects of the anesthesia are mild, and there is but little or no nausea, he allows the patients iced tea, lemonade, or wine and water on the day of operation, light food on the first day, and full diet on the second day after. This rule does not apply to persons who have undergone intestinal operations.—*Münchener medicinische Wochenschrift,* Dec. 2, 1902.

SOME STUDIES ON THE EFFECTS OF ATROPINE.

Much diversity of opinion exists both between clinicians and pharmacologists as to whether atropine is an intestinal paralyzant or intestinal stimulant. Hagen, working in Schmiedeberg's clinic, administered atropine in thirteen cases, giving it in doses as high as a milligramme without observing any paralyzing effects upon the muscles of the intestines. Ostermeier lays great stress upon these experiments, as they tend to corroborate his opinion that atropine is an intestinal stimulant, exciting peristalsis and producing a narrowing of the walls of the mesenteric vessels. He reports six cases of incarcerated hernia which underwent spontaneous reduction after the hypodermic administration of from 1 to 4 milligrammes of atropine. Aronheim agrees with Ostermeier, and also considers atropine to be of great value in perityphlitis and paratyphlitis, in which conditions he has employed it in doses of from 1 to 3 milligrammes, always with happy results. He shows that in all cases pain and tenderness upon pressure in the ileocæcal region disappeared; that the passage of flatus was reëstablished, and that painless stools occurred on the fifth or sixth day. Nausea, vertigo, and headache, such as follow the use of morphine, were absent. In addition to giving atropine, he gave phenacetine or antipyrin for the fever, and applied cold compresses locally. As a result of this experience Aronheim believes atropine to possess decided narcotic properties.

Gebele, of Professor Angerer's clinic, in Munich, has perused the literature of this subject very carefully, and concludes that the dominant action in atropine upon the intestine is paralyzing, and not stimulating, as Ostermeier believes; that it renders the nerve endings in the intestinal walls upon which peristalsis depends unresponsive to stimuli, and that though small doses excite the intestinal musculature itself, large ones paralyze it. He also denies Ostermeier's statement that it is a narcotic and anesthetic. Finally he condemns its use in mechanical, anatomic, and incarcerated hernia, and recommends surgical intervention in all cases which do not at once yield to morphine and the hot bath. It may be given in small doses in intestinal atony and ileus paralyticus, and in large doses in reflex intestinal spasm.

The most recent experimental evidence arises from the experiments made by Travers upon dogs and horses, and goes to show that atropine is an intestinal paralyzant. This is cited by Professor Pal, who summarizes as follows the results of experiments he has been conducting since 1899. As a rule atropine injures the end apparatus of the vagus and the splanchnics, and under certain conditions paralyzes them completely. The muscle of the intestinal wall and the ganglion which controls peristalsis remains unaffected. The tonicity of the bowel is manifestly though sometimes only temporarily reduced, and the bowel is likewise less susceptible to inhibitory reflex excitation. Therefore, in those cases in which such excitation is present, its administration produces a more favorable condition for intestinal movement. This exciting condition, however, must be present whether it be due to pathological causes or whether it be purposely induced. Very small doses of morphine act as an intestinal stimulus, and as morphine has generally been given in the cases in which atropine has been thought to produce such brilliant results, it may in part account for them. He claims that his experiments offer an explanation of the contraindications which

have beset the atropine question, and also furnish a foundation for the rational administration of the drug. "Thus it is seen," he says, "that the drug may be given with advantage in ileus paralyticus, a condition in which the intestine is under the influence of a reflex excitation. It should not be given in those cases of mechanical ileus in which there is a true stenosis of the intestine, but its favorable administration may be possible in such analogous cases as incarcerated external hernia, in which the circulation of the constricted loop of bowel is preserved." He concludes that it should not be given unless the mechanism of the ileus is thoroughly understood, a condition often most difficult to ascertain, and calls attention to the fact that the use of atropine presents not only the danger of producing poisoning which cannot readily be overcome, but also the greater danger of obscuring the typical symptoms of the disease and thus allowing most opportune time for necessary surgical intervention to pass by unnoticed.—*Münchener medicinische Wochenschrift,* November, 1902.

PARALDEHYDE AND SCOPOLAMINE.

BRUNKE, assistant physician in the Psychiatric Clinic in Freiberg, deprecates the fact that paraldehyde is not more frequently used instead of the newer hypnotics and morphine. After an experience of many years with the drug he claims that it is safe, that it is certain in action, and that its protracted use is unaccompanied by any unpleasant effects. He says that quite sound sleep is produced by doses of not less than three grammes, which may be increased to six, if the character of the insomnia renders it necessary. He has given as much as 24 grammes a day without producing any ill effects. Sleep supervenes in from three to fifteen minutes after the ingestion of the drug. The subjective sensations, before the oncoming of sleep, resemble that condition of normal fatigue which healthy individuals experience at their accustomed hour of retiring, and irresistible drowsiness obliges the patient to seek quietude and to dispel disturbing thoughts. Excitation never produces hypnosis. The duration of sleep varies, of course, with the character of the insomnia, the causes of the external conditions, and the size of the dose administered. Usually it lasts from five to eight hours. Eighty-five per cent of his patients sleep from 9 P.M. to 5 or 6 A.M. without requiring a second dose. In private practice he thinks it will hardly ever be necessary to give more than one dose.

The awakening from paraldehyde sleep does not differ in any way from the awakening from natural sleep, the patient feeling refreshed and strengthened. In accordance with the clinical experience that paraldehyde sleep entirely resembles natural sleep, there are several laboratory experiments which have proven that the drug produces a slight anemia of the brain by affecting the peripheral vessels, and causing changes in the distribution and pressure of the blood. This is exactly what occurs in physiological sleep. Aside from this action, the drug does not affect the brain at all, and its influence upon other organs is so slight that diseases of the heart, vessels, respiratory organs, alimentary canal, kidneys, and bladder do not constitute any contraindication to its employment, an advantage possessed by no other hypnotic. The suppression of the reflexes and the sensibility are practically the same as in natural sleep. Perception to pain is slightly diminished except in an exceedingly small number of cases. No addiction to the drug, as so-called paraldehydism, results from its therapeutic use. A few isolated cases are on record in which neuropathic individuals have taken from 30 to 60 grammes a day for months, as a result of which a condition presenting the symptom-complex of alcoholic delirium was produced. It disappeared in a few days after the drug was withdrawn. Acute poisoning does not occur when the drug is used in therapeutic doses, and as much as 105 grammes has been taken without causing any untoward effects. All forms of insomnia except those caused by severe bodily pain and those which occur in the course of certain violent psychoses yield to this remedy. It is greatly to be desired that the nervous insomnia from which so many brain-workers and other more or less neurasthenic individuals suffer, and also the insomnia of old age, should be treated more frequently with this hypnotic. If it

were done, many cases of drug addiction would be prevented.

In those states of excitement occurring in the insane which are characterized by great motor restlessness, volubility, violent and destructive propensities, Brunke has found it is injudicious as well as frequently impossible to give paraldehyde, and recommends scopolamine (hyoscine) hypodermically in doses of from one-half to one and a half milligrammes. The action of these doses is to reduce the excitability of the cerebral cortex, which is affected in from three to five minutes after the administration. The patients become quiet, and in the majority of cases fall asleep very soon. Tranquillity of sleep generally lasts from six to ten hours, yet some of the most violent cases become restless in two or three hours. To these a second dose of one-half to one milligramme is given. The after-effects of this drug consist in mydriasis, which often lasts for many hours, and a diminution in the secretion of saliva and sweat. He thinks that scopolamine might be employed with advantage to control the motor restlessness of fevers.

In conclusion, he says that the physician who knows how to use paraldehyde and scopolamine will be able to control all cases of insomnia and excitation, from the mildest to the most severe.—*Münchener medicinische Wochenschrift,* November, 1902.

THE TREATMENT OF SCARLET FEVER WITH ANTISTREPTOCOCCIC SERUM.

In 1891 BAGINSKY noticed that in cases of diphtheria complicated by scarlet fever, streptococci as well as the Loeffler bacillus appeared in cover-glass preparations which were made shortly before the outbreak of the exanthem, and he also found them in the internal organs, in the blood, and in the bone-marrow of individuals who had died of scarlet fever, and in the spinal fluid of patients affected with it. Because of their constant presence he attributed to them an etiological significance, although no specific action could be obtained with cultures made from them. Since the time of his first observation he has examined 701 cases and found streptococci present in the pharynx in 696 cases. In 100 cases which died from scarlet fever, streptococci were found in all organs, in the blood of the heart, and in the bone-marrow. Shortly after the constant presence of streptococci was demonstrated, Marmorek's antistreptococcic serum was tried. The results obtained were negative. Whereupon Aronson undertook the preparation of the serum from some of the cocci taken from the pharynx of scarlet fever patients and from the bone-marrow of those who had died of the disease. Before the serum was used therapeutically it was tried upon mice. Mice which had received 0.01 to 0.03 withstood injections of 0.000015 cubic centimeter of a very virulent streptococci bouillon which in 1/100 part of 1/1000 of a cubic centimeter dose is fatal to mice, even though all of them received Marmorek's serum.

Of 58 patients who were treated with the serum, three died; while of 63 to whom no serum was given, 9 died. Baginsky considers the number of cases from which this comparison of mortality was made to be much too small to warrant him in making any definite deductions concerning the therapeutic use of Aronson's serum, especially as no marked change in the general condition of the patients, nor in any single symptom of the disease, was observed after its administration. No decided sudden fall of temperature occurred after its use, although in 12 cases the fever declined gradually without any exacerbations. In the majority of cases the decline was irregular, being marked by longer or shorter periods of exacerbation. The exanthem disappeared generally in from nine to fifteen days. In most of the cases pharyngeal symptoms were present until the fourth week. Desquamation began from the fourteenth to the twenty-first day. Complications, such as otitis media, nephritis, lymphadenitis, and general affections, were observed in a considerable number of cases. In January he discontinued the use of this serum because such bad results followed its employment in four cases. These four cases presented rather unusual complications in addition to severe joint affections, otitis, and nephritis. In one case there was orchitis, in another nephritis, while in all four there was swelling and an eruption in the area around the point where the serum was injected.

A new serum which Aronson prepared has been used since March without producing any unpleasant effects.—*Berliner klinische Wochenschrift,* November, 1902.

THE TREATMENT OF COLON CATARRH.

In the *British Medical Journal* of December 6, 1902, T. S. WILSON gives the following advice:

The treatment of acute colitis must proceed along the lines usually adopted for this complaint, but the rheumatic element in many of these cases must not be neglected. With regard to the less acute forms of catarrh the amount that has been written upon the treatment of membranous colitis, and the number of remedies suggested in the text-books, is a sure proof that it is apt to be extremely intractable, and this is certainly so as far as the severe chronic cases are concerned. In the majority of cases, however, the disease is eminently curable if suitable means be adopted before it has advanced too far. The key to the treatment of this disease is, in the author's opinion, the recognition of its relation to gout and the "uric acid" diathesis, and also the recognition of the fact that it is a catarrh of the colon.

The first indication is met by the exhibition of the salicylates, in the form of sodium salicylate or salicin in the more acute cases. These sometimes have a remarkable effect upon those cases of cæcal catarrh perityphlitis which so closely resemble appendicitis, and the rapid disappearance of symptoms under this treatment often confirms the diagnosis of cæcal catarrh in a doubtful case.

In more chronic cases one of the combinations of salicylates with carbolic acid of the salol type seems to be the most effective, and this last named drug has proved of extreme value in the treatment of colon catarrh, even when it has reached the stage described as chronic membranous colitis. Another very effective treatment is by means of the combination of the perchlorides of mercury and iron, which is so useful in enteric fever.

The second point of prime importance to be remembered in the treatment of these cases is the fact of the undue irritability of the colon, both secretory and motor. Therefore the second main indication for treatment is the elimination from the dietary of all articles of food liable to leave an indigestible solid residue which may irritate the colon. The treatment must therefore take a line the exact opposite of that usually adopted for simple constipation.

Brown bread, porridge, figs, etc., which relieve ordinary constipation, are most potent in producing pains and excess of mucus in cases of colon catarrh, and in aggravating the irregular muscular action which is one of the causes of constipation in this disease. In fact, any vegetable food containing much woody fiber must not be admitted to the dietary; even bananas often disagree; also the skins and seeds of fruits, and all fruits such as pears, with a gritty pulp. In eating meat, care must be taken to remove the skin, gristle, and more fibrous parts. All indigestible solids should be removed from the dietary. These dietetic precautions, combined with the use of salol (20 to 30 grains per diem) will be found to produce great amelioration in the majority of the milder cases and in some of the severer ones. Where nervous symptoms have become prominent the treatment of these also constitutes an important part of the work of the physician, and the cure will be hastened by attention to hygienic, climatic, and social treatment, as well as to the medicinal and dietetic.

In cases of long standing, where considerable damage has been occasioned to the mucous membrane, treatment by enemata of simple saline solution, or with boracic acid, sometimes proves of value. In extreme cases it may be necessary to give the colon complete rest for some months by performing the operation of right inguinal colotomy, allowing no feces to pass along it. Several successful cases of this have been put on record in recent years.

The intractable nature of these chronic cases and the ease with which an early case can be cured emphasize the importance of early recognition of catarrh of the colon. Not only is early diagnosis necessary on these grounds, but also because, when not recognized and properly treated, catarrh of the colon, even in the less severe cases, is apt to cause very considerable suffering, both physical and mental, to those afflicted by it; and no small part of their suffering may sometimes be due to

the fact that they have constant and annoying pain, while retaining every appearance of health, and consequently are considered to be hysterical and making much of a little. The deceptive character of the early symptoms renders the early recognition of this condition far from easy, because they suggest to both patient and doctor the presence of a gastric rather than intestinal ailment.

TREATMENT OF GENERAL PARALYSIS AND TABES WITH MERCURIC BENZOATE.

LEMOINE (*Revue Neurologie*, July 30, 1902) refers to the current view regarding the unfavorable results of treatment of general paralysis and tabes, but records cases—six each of these diseases—which indicate that this view stands in need of revision, especially as regards paresis. Thus of the six cases of general paralysis treated by hypodermic injections of benzoate of mercury in daily doses of 3 centigrammes, marked amelioration followed in every case. Treatment was continued for periods of fifteen days, and an equal period was allowed to pass without injection of the drug. In some cases even 2 centigrammes per diem was found sufficient, and alternate treatment and rest for fifteen-day periods varying from three or four months to nearly a year was resorted to. The injection was in every case given deeply into the subcutaneous tissues or intermuscular fascia, and apart from slight pain no local symptoms were observed. Suppuration did not occur in a single case. The improvement in cases of general paralysis consisted of restoration of speech nearly to the normal, recovery of the faculty of memory (which had deteriorated), and a regaining of coördination, with abolition of tremors. Some degree of mental enfeeblement persisted in all cases, but the physical and mental improvements were marked and striking in character in all the six cases. In six cases of tabes dorsalis the improvement could only be described as slight, since "lightning" pain still occurred, and the knee-jerks were never regained. Ataxia was, however, diminished. The author thinks the results important enough to invite the attention of other workers, as the question is—especially as regards the treatment of general paralysis—one of great importance.—*British Medical Journal*, Dec. 6, 1902.

SALICYLATE OF QUININE.

In the *Practitioner* for January, 1903, Sir JOHN MOORE contributes a brief paper upon the use of this drug. He asserts that as an antirheumatic the preparation has few equals, and is surpassed only by salicylate of sodium. This salt is, however, distinctly depressing, and should not be pushed after the first few days of treatment. In such a case the quinine salt may be substituted with great advantage in 5-grain doses thrice daily, given in cachets or in a compressed form. In subacute rheumatism, also, quinine salicylate is most beneficial.

In diphtheria a tolerably wide experience during the past three years has led the author to rely on: (1) antitoxin in full doses (2000 to 3000 units), repeated in twenty-four or forty-eight hours as required; (2) resorcin used as a throat spray, in the proportion of 10 grains to the ounce; and (3) quinine salicylate in doses of 3 or 5 grains thrice daily, according to the patient's age and idiosyncrasy.

When writing on influenza for the fifth volume of the Encyclopœdia Medica, edited by Dr. Chalmers Watson, and published in 1900, the author said that in the treatment of that disease "quinine salicylate may be given in wafer cachets containing 3 or 5 grains as required, where the combined effects of salicylic acid and quinine are desired."

In pneumonic fever the salicylate has proved most useful as a tonic and general "alterative." By this latter term is meant a remedy which improves the general state of the patient, and so gives the disease-quelling forces of the organism free scope in their conflict with the existing toxemia.

It is in enteric fever that the happiest results have been obtained from quinine salicylate. This drug seems to be far superior to salol or any of the so-called intestinal disinfectants, the invaluable salicylate of bismuth not excepted. Given early in the disease, perhaps after a moderate dose of calomel has scavenged and disinfected the intestinal canal, and continued throughout the fever movement or

even into convalescence, quinine salicylate has appeared to regulate the bowels, correct the fetor of the evacuations, check tympanites, and control any tendency to vesical catarrh. Under the treatment the fever has seemed to run a mild and favorable course, the temperature falling gradually from the end of the second week. Also the more serious complications of the later stages of the fever rarely developed in cases so treated. Be it observed that the salicylate has never been given by the author as an antipyretic, nor could it so act in the moderate doses usually prescribed. In Sir John Moore's opinion energetic antipyresis in the treatment of enteric fever cannot be too emphatically condemned. Undue reduction of body temperature is the last thing to be desired or attempted in any form of fever. He heartily adopts Arnaldo Cantani's aphorism: "Das Fieber, das in so vielen Krankheiten der beste Verbündete des Arztes ist." (Berlin International Medical Congress, 1890.)

In scarlatina, erysipelas, and measles also the salicylate of quinine promises well as a general disinfectant and tonic. The almost specific effect of salicylate of sodium in erysipelatous affections is well known since Hallopeau, of Paris, published his researches on the subject in *L'Union Médicale* of May 1, 1881—more than twenty-one years ago. The author does not suggest the substitution of the quinine for the sodium salt, which may be applied topically in the form of a five-per-cent lotion on a compress, in addition to its administration internally. But the quinine preparation will prove an excellent adjuvant both in erysipelas and scarlatina, particularly in the advanced stages of these blood-destroying and enervating diseases, when a more tonic treatment is indicated.

In chlorosis—that form of anemia which so largely depends upon autointoxication, the result of habitual constipation in young women between the age of fifteen and twenty-five years—quinine salicylate cannot fail to establish its reputation as a gastrointestinal antiseptic and disinfectant. In such a case the bacillus coli communis, a non-pathogenic microbe under normal and healthy conditions, may very likely assume a pathogenic rôle, as it does in enteric fever, dysentery, summer diarrhea, and infective appendicitis. If this be so, an essential part of the treatment must be intestinal disinfection.

On Thursday, November 12, 1902, the author was called to see, in consultation with Dr. Rodolph Burnes, a young woman aged nineteen, who was so extremely anemic as to be in danger of her life from repeated attacks of syncope. The medical history was one of habitual constipation, anemia, and irregular menstruation, since she came to reside in Dublin two and a half years previously. The house in which she lived was modern, but abutted on a road bordered by an open drain, toward which the window of her bedroom faced. An outbreak of enteric fever had occurred about eighteen months previously in the immediate neighborhood. The patient's sister had died of acute peritonitis a short time before their visits. Dr. Burnes had treated the patient with aperients and a mild preparation of iron. Her removal from her father's house was advised, and steps taken to regulate the bowels and put her on five-grain doses of quinine salicylate three times a day. She improved rapidly under this treatment.

Recently, in a sharp attack of herpes zoster connected with the fourth cervical nerve on the left side, in a married woman aged twenty-eight, quinine salicylate undoubtedly relieved pain, and seemed to play successfully the part of a tonic.

The above are a few instances in which the author's personal experience of quinine salicylate has proved so satisfactory as to encourage him to bring the preparation under the notice of the medical profession. It is already official in the French Codex, and in the Mexican, Russian, Spanish, and Swiss Pharmacopœias.

EXPERIMENTS WITH FORMALIN IN SEPTICEMIA.

Another unfavorable opinion to the use of this preparation in septicemia has appeared in the editorial columns of the *New York Medical Record* of February 21, 1903. It states that Drs. W. H. Park and W. A. Payne have been conducting recently a series of experiments for the purpose of testing the efficacy of formalin in septicemia. The investigations in question were made in the bacteriological laboratory of the Health Department, and it

appears that the results obtained have not vindicated the claims advanced by Dr. Barrows, that formalin is a valuable remedy in puerperal sepsis by reason of its antitoxic action. The experiments were performed upon rabbits, and showed that when a formalin solution of the strength used in Dr. Barrows's case was injected into a number of rabbits inoculated previously with a streptococcus germ, the result was that these rabbits did not live so long as an equal number likewise inoculated with a streptococcus germ, but which had not been injected with formalin. With larger injections of formalin, it was found that the formalin lessened the resistance of the body to the invasion of bacteria. Dr. Park concluded, as an outcome of these and other experiments, that the amount of formalin injected by Dr. Barrows had very little effect upon bacteria, retarding for a few hours only the rapidity of the development of the germs.

The formaldehyde combines with the albuminous part of both the bacteria and the blood, and is consequently injurious to both. The affected bacteria quickly reproduce, and the formalin, being already consumed by the chemical combination that has taken place, has no further effect. The injury to the blood cells, however, is not healed so quickly. In short, the experiments would seem to show that formalin is of no use in septicemia, but is a source of some danger.

The fall in temperature produced by the injection of this agent is not so much owing to its action as to the presence of the solution. The article which appeared in the *Medical Record* of January 31 gives a clear presentation of the case for and against formalin as a remedy in septicemia, and the investigations made by Drs. Park and Payne tend to confirm the opinions therein expressed.

THE TREATMENT OF CHLOROSIS AND PERNICIOUS ANEMIA.

Byrom Bramwell in his *Clinical Studies* for October, 1902, has the following to say about the treatment of these conditions:

Until we have exact and more definite knowledge as to the cause of pernicious anemia our treatment must remain in the present very unsatisfactory condition. In pernicious anemia, as in chlorosis, rest to the enfeebled, fatty, and dilated heart is essential. A great many different remedies have from time to time been employed.

Iron often seems to do more harm than good; and this is exactly what we should expect from the condition of the blood. In most typical cases of pernicious anemia each individual red blood-corpuscle contains, as we have seen, more than the normal amount of iron; consequently, there is no indication for giving iron. There are, however, some cases of pernicious anemia in which iron seems to be in some degree beneficial, rather perhaps as a palliative than as a distinctly curative agent. In these cases the "color-index" is perhaps below the normal.

Arsenic is in many cases undoubtedly of great benefit; but the author has never personally known any case in which a lasting cure has been brought about by the administration of arsenic, though some cases of permanent (?) cure have been reported. Still, he believes, so far as his experience enables him to judge, that arsenic is more beneficial than any remedy which has hitherto been employed.

The author was led to try arsenic in the treatment of pernicious anemia for the following reasons: He knew that in pernicious anemia the heart is in an advanced stage of fatty degeneration; he knew that in fatty degeneration of the heart arsenic is often of great benefit. Hence, he thought he would try arsenic in pernicious anemia. He did so in the case which he reported, with the result that most striking improvement immediately took place, and that after fifty-five days the patient was discharged from hospital apparently quite well.

Provided a patient who is suffering from pernicious anemia can take large doses of arsenic, the author almost always finds that improvement, and in many cases temporary cure, results.

In his book on the "Diseases of the Blood" he has tabulated twenty-four cases in which arsenic was well borne. In ten of these cases there was complete temporary recovery; in six cases marked temporary improvement; in four cases slight improvement; and only in four cases no improvement. Whereas, of nine cases in which arsenic was badly borne, in one case

there was (? temporary) recovery under iron; in seven cases there was no improvement; and in one case the result was not known.

The exact manner in which arsenic produces its beneficial effects in pernicious anemia is not known. Various theories have been suggested, such as stimulation of the bone-marrow, the production of more stable red corpuscles, diminution of the ferrogenic function of the liver, antiseptic action on the stomach and intestines, etc.

In giving arsenic in pernicious anemia the author always begins with a small dose—two drops of Fowler's solution three times daily—and gradually increases the quantity until the maximum dose which the patient can take is reached. He has, in some cases, given as much as 60 drops of Fowler's solution per diem.

He admits that there is some risk in giving these large doses. He has in several cases seen chronic arsenical poisoning (pigmentation of the skin and peripheral neuritis) produced. But so long as the patient is improving, in respect to the pernicious anemia, he is content to allow him to run some risk.

It is very important, he believes, to continue the administration of arsenic in small doses, after improvement has occurred or a (temporary) cure has taken place, and it is quite possible, if this were regularly and systematically done, that the improvement or cure would be more lasting.

He believes that arsenic is more efficacious in the first attack than in the subsequent relapses. This is only what one might expect; for in the later stages of the disease the lesions are so advanced that they are much less likely to be influenced by any plan of treatment.

Phosphorus has been given with some success by Sir William Broadbent and others.

Bone-marrow, which was introduced by Prof. T. R. Fraser, has in the author's hands been of little or no benefit. But a few cases, in addition to the one originally published by Professor Fraser, have been reported in which great benefit followed its administration. However, it may be confidently stated that the consensus of opinion is that bone-marrow is beneficial in comparatively few cases of the disease.

Intestinal antiseptics (such as B-naphthol, salol, and salicylic acid) which were recommended by Dr. William Hunter, in the belief that pernicious anemia is due to the absorption from the intestine of a toxin, have also, up to the present time, been attended with very uncertain and on the whole unsatisfactory results; though a few striking successes have been reported by Hunter, Gibson, and others.

Washing out the stomach and intestines with antiseptic solutions has in some cases, it is said, been attended with benefit.

Lately Dr. Hunter claims to have had very beneficial results from extracting diseased and decayed teeth, the application of antiseptics to the unhealthy gums, and the internal administration of perchloride of mercury. The author had one case in which this treatment seemed for a time to produce marked benefit. But that patient, like all the other cases of pernicious anemia which he has had an opportunity of treating, has recently relapsed, and is now apparently about to die from the disease.

The injection of antistreptococcus serum has in a few cases been very efficacious. Dr. Menzies, while house physician to Dr. Mitchell Bruce at the Charing Cross Hospital, had the opportunity of watching two cases which Dr. William Hunter treated in this way, and in both of these cases very marked improvement resulted. Dr. Elder, too, has reported a very successful (temporary) result; but it is understood that in that case a fatal relapse after a time occurred.

Transfusion of blood has, in some cases, been practiced. The author has seen decided temporary benefit produced by it, but so far as he can judge it is merely a palliative; and it is attended with the practical disadvantage that it is difficult to carry out in private practice, and that there is often considerable difficulty in getting a healthy person who is willing to be bled and to give his blood to the patient. In one case which the author saw in consultation a few years ago, a considerable *douceur* was necessary to attain this end. No doubt in this, as in so many other matters, it is simply a matter of supply and demand.

In some cases transfusion has been harmful rather than beneficial.

Inhalations of oxygen are sometimes useful as a palliative.

THE TREATMENT OF ACUTE PERICARDITIS.

In his *Clinical Studies* BYROM BRAMWELL gives this advice as to the treatment of this serious condition. With the object of trying to arrest the pericardial inflammation, a blister, leeches, or dry cups may be applied over the precordial region. General bleeding, which used to be so extensively employed in the treatment of inflammations—and in fact, in all forms of disease—is now very rarely employed in the treatment of acute pericarditis. The author believes that there are some conditions, the early stages of some inflammations and uremic convulsions, for example, in which venesection is a most valuable means of treatment.

The application of cold (an ice-bag, Leiter's coil, or Maw's aluminum calfrigerator) or of heat (very hot fomentations) to the precordial region has also been recommended in the earlier stages of acute pericarditis. It may seem strange that such opposite things as heat and cold should be employed for the same purpose, but the action of heat and cold when applied directly to the blood-vessels themselves, in the form of hot or cold water, is the same—they both produce contraction of the vessels; but the contraction produced by heat is the more energetic and lasting. The author refers to his student days, when a bleeding stump or a bleeding uterus was douched with cold water. The surgeon and gynecologist now use hot water. We do not know with certainty whether the application of heat and cold to the surface of the body produces contraction of the vessels of the internal organs; but it is reasonable to suppose that the vessels in the parietal layer of the pericardium at all events may be influenced in this way.

At the commencement of an attack of acute pericarditis, more particularly in those cases in which the pulse is full and strong, a brisk purge may be administered —a concentrated dose of sulphate of magnesia is as good as anything else. The great danger in most cases of acute pericarditis is failure of the action of the heart. Consequently, antimony, aconite, veratrum viride, general venesection, and other remedies which produce depression, are contraindicated.

Quinine is a useful remedy in many cases of acute pericarditis; it may often be advantageously employed, not only at the commencement but throughout the course of the attack. In many cases of pericarditis, Niemeyer's pill (quinine, digitalis, and opium) is considered a valuable combination.

When the pericardial inflammation has been present for some time before the patient comes under treatment, it is of course useless to attempt to cut short the inflammatory processes. At this stage of the disease the treatment must be guided by the associated conditions which are present, and especially by the fact whether the pericarditis is dry or moist—whether there is much or little inflammatory fluid in the pericardial sac.

Most cases of dry pericarditis get well of themselves; in cases of this description drugs are not as a rule required, except for the relief of symptoms. A blister or warm fomentation should be applied over the region of the heart. If the precordial pain is severe, morphine or opium may be given by the mouth or hypodermically. In most cases of dry pericarditis nature may safely be allowed to take her course, so far as the pericardial inflammation itself is concerned. Too active drug treatment may do more harm than good. It is well to remember that in treating disease one can do harm as well as good.

The drug treatment appropriate for the primary condition (rheumatism, Bright's disease, etc.) with which the pericarditis is associated should be continued.

ADRENALIN IN UNCONTROLLABLE HEMORRHAGE.

Dr. OTTO LANGE, of Baden-Baden, reports six cases of severe hemorrhage which were controlled by adrenalin. One was that of a hemophiliac who received a wound on the thumb, the bleeding from which resisted all treatment until an application of equal parts of adrenalin and normal salt solution was made, whereupon it was immediately and permanently arrested. Two cases of hemorrhage caused by drainage-tubes pressing against granulation tissue in operation wounds yielded readily to the influence of adrenalin tampons, although other styptic tampons had

produced only a temporary arrest of bleeding. An obstinate case of epistaxis was also controlled by packing the nares with strips of gauze soaked in adrenalin. In two instances the drug was administered internally, once in hemoptysis and once in hematemesis accompanying carcinoma. The case of hemoptysis was of three days' duration, and had resisted morphine, injections of ergotin, and gelatin, but ceased after thirty drops of adrenalin had been given twice within about two hours. The case of hematemesis was controlled by a few doses of the drug.

Although not large, Lange believes that this series of cases attests the value of adrenalin in hemorrhage.—*Münchener Medicinische Wochenschrift,* Jan. 13, 1903.

THE TREATMENT OF POSTDIPHTHERITIC PARALYSIS AFFECTING THE GENERAL NERVOUS SYSTEM.

In the course of an article on this subject in the *Medical News* of February 14, 1903, PETER states that the treatment of diphtheritic paralysis is of unusual interest because we have at our disposal the means of prevention in many cases, or at least of modifying the severity of the palsy. Rainy conducted a series of experiments upon guinea-pigs with diphtheritic toxin and antitoxin. By these experiments he found that by injecting a large dose of antitoxin into the animal an injection of the diphtheritic toxin in excessive doses was not followed by paralysis, although in the control experiment, in which the antitoxin was not used, the animal invariably developed paralysis. Not to go into detail, his conclusions in substance were that in the guinea-pig at least antitoxin was an absolute protection against paralysis when administered in sufficiently large doses soon after the introduction of the toxin.

These experiments and the experience and statistics of others furnish us with undoubted proof of the assertion that much may be done to prevent and mitigate this menace to childhood. Aside from the use of antitoxin as a prophylactic against paralysis, it is doubtful whether we have not been too slow in grasping this means offered us for combating the primary disease early in its course.

As the early administration is of paramount importance for the successful recovery of the patient from diphtheria, so it is of greatest importance to eradicate from the system, or probably rather to prevent the formation within the system of toxins which act so destructively upon the nervous system. This confidence in the serum as a means of preventing paralysis has been expressed by most writers of to-day, and the view seems to be especially warranted by facts. The extensive use of the serum, however, has lowered the mortality rate of diphtheria very considerably without at the same time diminishing the proportion of cases which are followed by paralysis, and this may seem to detract from our argument. The explanation, however, is simple. Our mortality rates are materially lowered, from which we can conclude that many severe cases are restored to health, perhaps only after protracted illness and profound infection. And it is not unreasonable to conclude that these severe cases restored to health, which under former methods of treatment would probably die, are more frequently followed by paralysis than the mild cases in which the toxin has been eradicated very early.

A second means of prevention, and one which ordinarily should be mentioned first, but which the author prefers to place second to serum, in order to emphasize the latter, is absolute rest. Of the more serious forms of paralysis, the heart and diaphragm suffer out of proportion to the rest of the body, and the reason is apparent. The muscular system in general is placed at rest at least during the acute stage of the primary disease, whereas the heart and diaphragm are in a constant state of activity, and in fact are doing a greater amount of work than in health. Parts functionally at rest are better prepared to withstand the action of toxins, especially when their nutrition is directly affected by the poison.

Absolute rest is undoubtedly imperative, not only during the acute stage of diphtheria, but for some days after the external evidences of the disease have disappeared. Since the introduction of the serum this precaution is especially important. The duration of the acute febrile attack has been shortened to four or five

days in the majority of instances, in contrast to the former average duration of fifteen days, and the tendency to accede to the will of patients and parents in allowing patients up too soon the author believes to be responsible for a not inconsiderable number of cases of paralysis.

What is true of rest as a prophylactic measure in the acute stage of the disease is doubly true of it as a curative agent after paralysis has made its appearance. As a preventive measure it ranks equally with serum, but as a curative agent it easily takes first place in our armamentarium, not only in severe heart cases, but also in mild cases of paresis. The patient should be placed absolutely at rest in bed and be given a nutritious diet. In a majority of cases improvement will follow these measures alone. Of great assistance in hastening recovery are massage and galvanism.

Among the drugs of value to be administered internally, iron and strychnine in liberal doses are probably the most satisfactory.

In severe cardiac paralysis, with bradycardia, vomiting, and subnormal temperature, little can be done except by supporting the heart by hypodermic injections of strychnine and supplying heat to the body. Cardiac stimulants are contraindicated. Stimulation of an overworked, degenerated heart muscle will accomplish nothing but harm.

In respiratory paralysis, artificial respiration has been known to save life.

TYPHOID FEVER: ITS ANTISEPTIC TREATMENT IN TWENTY-FIVE CONSECUTIVE CASES.

In the *Atlanta Journal-Record of Medicine* for February, 1903, BILLINGSLEA expresses the view that there is a value to be looked for from an effective antiseptic treatment. Recent researches have disclosed the existence of various forms of clinical typhoid, which, however, fail to fulfil the bacteriological test. It is probable that these cases belong to two groups of infection whose symptoms closely resemble typhoid, but differ in some particulars, and especially as regards Widal's reaction. These are infections due to groups of bacilli intermediate between the colon and typhoid bacilli, and subdivided into paracolon or paratyphoid, as they approximate to one or the other. It is tolerably certain, however, that, given a really effective antiseptic, for clinical purposes all distinction between these groups might be ignored. An antiseptic as powerful as bichloride, but quite innocuous, would most probably prove of equal service, whatever the nature of the bacillary infection.

Such an antiseptic seems to exist in the case of acetozone (benzoyl-acetyl-peroxide), which comes to us with the indorsement of Professors Freer and Novy, of Ann Arbor University, Mich. Wasdin also has recorded twenty-four cases treated with this drug, with a speedy subsidence of fever, a small proportion of complications, and a material lessening of the disease. While the author has always been an advocate of conservative treatment, and has made it his aim to "hasten slowly," the foregoing facts have impelled him, seeing as he does a large number of typhoid cases, to give it a fair trial. During the past year he has treated with acetozone in private and hospital practice twenty-five cases of typhoid fever, and the results have certainly surpassed his expectations, not a single death having occurred. In no case was there delirium or any other complication; no tympanites or diarrhea, and no hemorrhages. Acetozone seemed to render the system immune to the typhoid toxin, so that if the patient came under treatment at the outset the disease seemed to be jugulated; while, when it did not come under observation until the disease was well established—say within the first seven days—it was yet materially shortened by about one week. A marked influence was exerted on the temperature, a point of much significance, which requires no enlarging upon. It has been the author's practice to have his cases of typhoid diagnosis submitted to the Board of Health for confirmation, and certificates from the board will prove conclusively that the favorable course these cases have run has not been due to an error in diagnosis. He feels no hesitation in ascribing the results to the treatment adopted, which was essentially that described recently by Dr. Wasdin, and also practiced at the Cook County Hospital.

The first thing is to clear the bowels thoroughly by a good dose of calomel, which may be administered in one large dose or in frequently repeated small doses, as the physician thinks best. Liquid diet is prescribed, and cold sponge or tub baths, according to the generally adopted methods, which may be ordered as occasion calls for them.

The special treatment consists in dissolving 15 to 20 grains of acetozone powder (equal to 7½ or 10 grains of the benzoyl-acetyl-peroxide) in a quart of water and giving the patient this amount to drink in the twenty-four hours both in water and in milk, diluting the milk one part of acetozone solution to three parts of milk. The action of the drug will be materially aided by administering a mild saline laxative, say sodium phosphate or magnesium sulphate, every other day. In addition to the advantages of the treatment already enunciated, the author has found that the feces soon lose the disagreeable odor that commonly characterizes typhoid stools; that while cold baths may be used as required, they are required to a much smaller extent than with other treatments; that the nurses universally affirm that they find the patients under this line of treatment much easier to care for and to manage; and that no evil results have, so far, been noted from the use of acetozone. On all counts, therefore, the author trusts that the profession will accord to this treatment a fair and unprejudiced trial.

METHYLENE BLUE IN CONSUMPTION.

In the *Journal of Tuberculosis* HERBERT details his results in the use of this agent, and says that it is of little value.

In the cases cited by the author, and in a few more not particularly mentioned, it has been observed that methylene blue causes in large doses nausea and even vomiting; nearly all cases complained of strangury, which subsided after a short period; in most of the cases it produced a sensation of "choking."

No doubt methylene blue is a drug which impedes the expectoration of the contents of the bronchial tubes, thus causing a sensation of "choking" or even dyspnea. Methylene blue reduces the mucopurulent sputum to a mere purulent sputum; the mucoid part of the sputum is thereby retained or absorbed and its discharge decreased. Therefore the sputum becomes more concentrated and thus shows an enormous increase of bacilli; but the drug has no local effect upon the tuberculous lesions of the lungs or of the throat; it has furthermore no influence whatever upon the temperature.

The only advantageous feature of the drug consists in reduction of the amount of expectoration and that it relieves the cough; it may therefore safely be administered in chronic advanced cases of phthisis with profuse mucopurulent expectoration. It is contraindicated in sensitive and in hectic cases.

STUDIES OF ALCOHOL.

As a result of experiments upon man and some of the lower animals, BINZ, of Bonn, has reached the following conclusions concerning the action of alcohol. Moderate doses slightly increase respiratory action; the same quantities produce a decided increase when given to individuals who are fasting, or who are fatigued; the same increased rate of respiration is present when the alcohol produces drowsiness or sleep; the increase results from direct stimulation of the nerve centers, and is not reflex. It was also found that the aromatic substances contained in wine possess intrinsiç stimulating properties. The author's experiments relative to the action of alcohol upon the heart and vessels were not so satisfactory as those dealing with its action upon the respiratory organs, because of the various factors which influence the final product, such as the volume and frequency of the pulse, the muscular power of the heart, the caliber of the arteries; and he is unwilling to express a definite opinion. He found that moderate quantities of the drug did not seem to exert any paralyzing influence upon the heart itself nor upon its inhibitory nerves. He thinks that alcohol is the best drug that can be used in collapse, and believes that many lives would be saved if it were more frequently employed. With the exception of a few experiments made upon animals for the purpose of determining whether increased frequency of respir-

ation was due to reflex action, all investigations were conducted upon men.

Binz also discusses the value of alcohol as a food, and reviews the investigations of Offer, Rosenfeld, Neumann, Atwater and Benedict, and Ott. He is in accord with the preponderance of opinion that moderate doses of alcohol given to healthy individuals conserve not only the carbonaceous elements of the body, but also the albumins.—*Berliner klinische Wochenschrift,* Jan. 19 and 26, 1903.

GANGRENE OF THE NIPPLES IN THE PUERPERIUM AFTER THE USE OF ORTHOFORM.

In the report on the progress of obstetrics made to the *Boston Medical and Surgical Journal* of January 29, 1903, by Dr. FRANK A. HIGGINS, he mentions the possibility of gangrene of the nipple developing as the result of the use of orthoform, and has the following opinion to express in regard to a case reported by Vincent:

Four years ago in this department there were reported some instances in which orthoform was used for fissures and cracks of the nipples in nursing women. At that time orthoform was recommended as an antiseptic powder and also as a local anesthetic. Orthoform was declared to be perfectly harmless for external use and absolutely non-toxic for the baby.

A case has been recently reported by Vincent in which orthoform was used for excoriated nipples, and the nipples also protected by rubber shields. Some days after its use the whole front of the breast became covered by a dark-red rash, the skin infiltrated, edematous, and very tender, and the question of erysipelas was raised, as there was a slight resemblance to this disease. The patient's general condition, however, there being no constitutional symptoms except local pain and slight headache, quite excluded erysipelas. The nipples became grayish-black in color with absence of sensation, and soon became definitely gangrenous. The rash extended to the chest, the back, and also to the buttocks. Both nipples sloughed, and healing occurred slowly by granulation. The author says it is impossible to prove the cause of the gangrene, but he believes it to have been due to the orthoform, as such a rash is well known to those who use orthoform in general surgery. In a letter to the *Lancet* of April 12, 1902, the writer, George Pernet, in referring to Vincent's case, believes there is no doubt that orthoform was the cause of both the rash and the gangrene, as several instances of the latter complication have been recorded.

Since its introduction the reporter has used orthoform a considerable number of times for fissures of the nipples, and has known of its use in many other cases, and without any harmful effect. He has usually used it in alcoholic solution, however. It would seem, therefore, that its use in powder form at least is not without danger.

A METHOD OF TREATING ACUTE INFECTIOUS DISEASES.

WERNITZ, of Odessa, reports a method of treating acute infectious diseases by the administration of salt solution per rectum. After the lower bowel has been washed out, one liter of a one-per-cent salt solution is introduced very slowly, a little at a time, by means of a rectal tube and irrigator. About one hour is generally taken for its administration. The process is repeated every one or two hours, according to the severity of the case. In a case of acute septic infection ten liters was thus given in twenty-four hours. At first absorption is very slow, but it gradually becomes more rapid. The pulse becomes fuller, the dry mucous membranes become moist, the patient is quieter, and headache and delirium disappear. Soon a free secretion of urine occurs, the skin becomes moist, and after the administration of the second or third liter a profuse sweat supervenes, accompanied by a fall of temperature. If the injections be discontinued the temperature rises again. Slight rises of temperature occur also in the intervals between administration of the injections, but they are progressively less and less.

Wernitz claims that this method possesses decided advantages over intravenous transfusion, inasmuch as it does not overwhelm the weakened and exhausted heart with large quantities of fluid, but gives to the organism only as much fluid as it can bear. He has not noticed that when the heart is very weak only a little fluid is absorbed at first, but that absorption becomes more and more rapid as the

heart and circulation improve. Good results have been obtained in all cases in which the method has been employed.—*Therapeutische Monatshefte,* January, 1903.

CARDIAC STIMULANTS.

In the course of an article contributed to the *Journal of the American Medical Association* of February 7, 1903, PATTON states that, next to digitalis, strychnine is the most useful of cardiac remedies. As a cardiac stimulant it is useful in the hypostolic period of all lesions, and is the only stimulant which can safely be used as such in connection with digitalis in any lesion at any stage. It is essentially the best stimulant when the right ventricle is overtaxed from rapidly developed strain. Its frequent hypodermic use is a most valuable means of stimulation in emergencies. The dose is from 1/25 to 1/15 of a grain. J. Basil Hall recommends large doses as a prophylactic against surgical shock. He gave one-fourth of a grain in two cases of impending death from air embolism with recovery. He things it futile in such cases to give less than one-tenth of a grain. Baumgarten thinks that in cardiac weakness the best results are obtained from small doses of strychnine, because large doses, besides having undesirable effects on the entire spinal cord, by raising blood-pressure immoderately increase resistance to the heart's action long before it can assist it indirectly; that it must be used before the strength of the heart has sunk too low, because of Binz's statement that strychnine raises blood-pressure by increasing reflex irritability of the vasomotor center, and not by stimulation, thus necessitating peripheral impulses to accomplish contraction of the vessels. Strychnine must fail in the very conditions of collapse for which it is so much depended on if used late in severe illness. Moderate doses should not be long continued, because, like digitalis, it may accumulate. Binz charges clinicians with not being as well acquainted with the cumulative effects as physiologists and pharmacologists. Lauder Brunton says strychnine is a "cumulative poison," as it contracts the renal arteries and thus prevents its own excretion. A. H. Carter admits the utility of strychnine as a heart tonic for occasional use, but thinks its prolonged administration not justified except in the smallest doses.

The clinician is forced to deal with conditions of disease as he finds them, and is not always able, nor does he always attempt, to reconcile clinical results with physiological argument—a privilege which the author avails himself of. The dosage of such remedies as strychnine must ever be a relative matter. The author has administered strychnine continuously in one-thirtieth of a grain doses thrice daily for periods of from six to eight weeks with results which he believes to be satisfactory in every respect. Also, he has given one-fifteenth of a grain hypodermically every two hours for forty-eight hours, and for two or three doses every hour, in critical collapse in pneumonia, with prompt response to every dose and final recovery. He has seen prompt and effective results from one-tenth of a grain in traumatic and surgical shock, and he is therefore not prepared to accept the second conclusion of Baumgarten.

Strychnine, in small doses, is the most valuable heart tonic we possess, and is particularly adapted to the treatment of senile lesions by continuous administration over periods of several weeks. During the second and third decades of life strychnine is not as well borne as it is later, being likely to excite and irritate the nervous system.

FURTHER REPORT ON THE USE OF ETHYL BROMIDE AS A PRIMARY ANESTHETIC TO ETHER.

In the *Annals of Gynecology and Pediatry* for February, 1903, EMERY MARVEL reminds us that he has already made a contribution to this subject, and now has still further experience which he wishes to report. Since the presentation of the paper to which reference has been made, this method of anesthetization has been employed by the author in thirty-three operations. With few exceptions it has been employed in all operative cases for which ether was selected as the anesthetic. The author has not used ethyl bromide when chloroform has been administered. The anesthetic has been administered by either Drs. Frank Katherman or W. Garrison

Noe, resident physicians at the Atlantic City Hospital.

Thirty of these cases have required celiotomies. Of the thirty-three, twenty were females and thirteen males, with ages ranging from four to seventy-six years. The time required to secure unconsciousness varied from nine seconds to two minutes—the average time about twenty-five seconds. One case was not influenced by the agent; this was probably due to the deterioration of the drug. The influence upon the circulation was shown to be slight acceleration of the heart and a mild increase in arterial tension; that upon the respiration to be occasional dyspnea with consequent cyanosis of a mild form; in but one case was coughing excited. The muscular contraction was also manifest in some cases, but of only a moment's duration.

The advantages of anesthetizing by this method over that of administration of ether alone are:

The shorter time required to secure anesthesia.

The reduction of the discomfort to the patient taking ether shown in the absence of the bronchial irritation, with the increased mucous secretions and consequent coughing.

The diminished dangers by injury due to violence from the more marked and longer lasting excitation in the muscular contraction that frequently takes place in the first stage of ether narcosis.

The smaller amount of ether required with the consequent more rapid regaining of consciousness, and the diminished tendency to postanesthetic vomiting.

These advantages seem sufficient to engage our interest and invite the employment of a method simple in its technique and so promising in its good results.

EPILEPSY: ITS TREATMENT, HYGIENIC, MEDICINAL, AND SURGICAL.

In the *Journal of the American Medical Association* of January 17, 1903, BROWER says that we are all agreed that the most generally useful remedy for internal use is the bromides. The bromides give relief, more or less, in at least eighty per cent of the cases. But there is a percentage of cases, certainly not less than ten, in which in the author's experience the bromides give no relief, but do damage. In the administration of the bromides in every case great care must be exercised that the dose is such as will not produce mental deterioration, for it is very much better for the average epileptic to have an occasional explosion with mental integrity than it is to be relieved of all explosive efforts, with mental enfeeblement. The bromide preferred is the bromide of sodium. The author has seen no particular benefit from a combination of the various bromides, and in his clientele he has seen no advantage from the use of bromide of strontium.

The bromide should be administered in some one of the mint waters, changing the vehicle from time to time, in order that distastefulness for the combination may not be established in any case. For children the author's rule in the administration of the bromides is to give a grain for each year of their age. In adults he rarely exceeds twenty grains three times a day, and in every instance advises that the bromides be taken after eating. In recent cases that have not been under the bromide treatment there may be reason for pushing the bromides to the extent of complete bromism, beginning with twenty grains three times a day, and each week increasing the dose up to complete saturation. But this condition of things should in no case be maintained except for a short space of time, and is only applicable to cases in which the disease has just recently developed.

If the dose of bromide that has been specified fails to relieve the patient, he adds to the treatment the fluid extract of *Solanum Carolinense*. It is a synergistic remedy. Beginning with half-teaspoonful doses it may be pushed to two-drachm doses, and it will, without any mental deterioration, sometimes relieve the paroxysms. In some cases, especially where there is cardiac enfeeblement, and this is the case with very many epileptics, the fluid extract of *Adonis vernalis*, in from a half- to five-minim doses, may be added with advantage to this combination, and relief obtained without pushing the bromides beyond the sixty grains per day already indicated. If this combination fails to relieve the patient, and the other import-

ant aids to treatment have been carefully attended to, some one of the coal-tar analgesics may be added to the treatment, as acetanilid, phenacetine, antipyrin; and if these several combinations fail to produce the desired result, with the bromide and *Solanum Carolinense* treatment may be added the use of belladonna, and probably the best way to administer the belladonna is according to the Trousseau method. Trousseau's formula is:

℞ Extracti belladonnæ, gr. 1/5;
Pulv. foliæ belladonnæ, gr. 1/5.
For one pill.

During the first month the patient takes one of these pills every day, in the morning if his attacks occur chiefly in the daytime, or in the evening if they are chiefly nocturnal. One pill is added to the dose every month. The drug should not be pushed beyond dilatation of the pupils, and uncomfortable dryness of the throat. While the patient is under the bromide treatment, attention should be given from time to time to the condition of the blood, and the anemia that belongs to the disease naturally, and which is often very much intensified by the use of the bromides, should be combated. The bromide of iron is a very good agent with which to do this, as is also liquor ferri et ammonii acetatis, and sometimes the correction of this anemia will make the treatment, otherwise unsuccessful, satisfactory. The anemia of these patients may sometimes also be combated by the use of cod-liver oil. Especially is this true of treatment during the winter months. The alkaline bromides produce, after a time, in some cases an irritable condition of the bladder; then the hydrobromic acid should be substituted for a time, or the new combination of bromine with oil of sesame, called bromipin, may be used.

Where the bromide treatment fails, some have had success from adding to it borax in ten-grain doses, three times a day, but the author's experience with borax has not been very satisfactory. Occasionally, where the bromides fail with the combinations already suggested, the bromides may be continued, and the oxide of zinc in from three to five grains may be added to the treatment with benefit. While under this treatment, even where only a small dose of bromide is administered, the patients will, of course, complain very much of the bromide acne. Especially will this be the case with women, and this may sometimes be overcome by the use of preparations of arsenic. If the bromide of sodium is administered, the liquor sodii arsenatis in from three- to five-minim doses may be put in the prescription already indicated, and arsenic is not only a benefit to them for this reason, but as a tonic and alterative to the nervous system it is often of very great service. In epileptics with poor circulation in the extremities, a condition that will be often very much exaggerated by the use of bromides, strychnine will be of service, in from one-sixtieth to the twentieth of a grain, administered three times a day, as a substitute for one of the adjuncts already suggested.

THE USE OF ADRENALIN CHLORIDE WITH CHLORETONE IN DISEASES OF THE NOSE.

To the *Berliner klinische Wochenschrift* of December 29, 1902, BAEZA contributes a paper upon these interesting drugs. After rehearsing many facts in regard to their physiological action which are familiar to us all, he states that his results have been very satisfactory in the following conditions:

He employed it in ten cases of extraction of polyps, one of curettage of the sphenoid cavity; in six ear operations after tonsillotomy, and in nasal operations for the control of hemorrhage; and for the purpose of exposing the operative area by causing contraction of congested mucous membranes. Altogether, his experience leads him to consider that the drug is a most valuable one.

INTOLERANCE OF MILK DIET.

The following suggestions are given in the *Journal des Praticiens* of December 20, 1902, by Dr. ROBIN. After pointing out the fact that certain patients do not seem to be able to take milk and digest it, and yet in many of these instances it is the diet which is actually needed, he goes on to a consideration of the means by which we may aid its digestibility. The disagreeable effects which sometimes ensue in patients who are put upon this diet are

pain, tympanites, constipation, or diarrhea. The pain can be avoided, he thinks, by the use of the following formula:

℞ Bicarbonate of soda,
Calcined magnesia, āā 1 drachm;
Prepared chalk, 1½ drachms.
Mix and make into ten packages.

One of these may be taken after each drink of milk, and if it is thought wise, 6 or 8 grains of pepsin may be added to each powder. In other instances one or two pills of pancreatin may be employed.

For the relief of the gas he recommends the employment of

℞ Fluoride of ammonium, 3 grains;
Distilled water, 10 ounces.
A teaspoonful after each dose of milk.

For the constipation we may resort to rectal injections, or give a pill of aloes, belladonna, and strychnine; while for diarrhea, if it occurs, one of the vegetable astringents may be given, or the subnitrate of bismuth may be administered.

RADIOTHERAPY AND PHOTOTHERAPY FOR THE TREATMENT OF CARCINOMA, TUBERCULOSIS, AND OTHER SKIN DISEASES.

Though their usefulness will be found later to be more restricted than appears to be the case at present, there is no doubt that both phototherapy and radiotherapy are valuable additions to the known methods of treating diseases like carcinoma, tuberculosis, and other diseases of the skin. As to the comparative values of the two procedures, HYDE, MONTGOMERY, and ORMSBY (*Journal of the American Medical Association*, No. 1, 1903) are unable as yet to draw definite conclusions. Though radiotherapy is readier of application and apparently has a wider field of usefulness, phototherapy, in lupus erythematosus, has repeatedly given excellent results in cases where the *x*-rays failed. In treatment of tuberculosis of the skin, too, the better results are obtained with phototherapy, there being better cosmetic effects and no danger of deep burns.

In superficial carcinoma involving considerable areas, radiotherapy is undoubtedly preferable to all other known methods of treatment. Superficial lesions more circumscribed are equally amenable to treatment with the *x*-rays, though in many instances small tumors can be removed more promptly by complete erasion or excision. For many of these circumscribed growths it may be best to advocate removal either with the knife or curette, followed by a series of treatments with the *x*-rays. In operable carcinoma of the skin which includes deeper tissues, there should be complete extirpation followed by *x*-ray treatments. Where the growths are inoperable, radiotherapy offers a probable chance of recovery or lessening of the discomfort of the patient.

There is a possible danger in the treatment of carcinoma that has not been sufficiently recognized. In exciting an inflammation in carcinoma the operator to some extent encourages an extension of the growth, through a dissemination of the cancer cells to normal or inflamed tissue surrounding the growth.

The value of radiotherapy in extensive cases of hypertrichosis has been fairly well established. Excellent results have been obtained in the majority of cases of psoriasis treated. It has unquestionably been used successfully in many of the chronic inflammatory diseases of the skin, especially in acne rosacea, folliculitis, and suppurating wounds, but until it can be used with greater accuracy it should be reserved for those cases in which better known and better controlled methods are not successful.

The current used was from induction coils having a voltage of from 10 to 12, and an amperage of from 1½ to 3 (rarely 4 or 5). The distance from the anticathode of the lesion exposed to the *x*-rays varied from 5 to 15 inches, the duration of the treatment from three to ten minutes, and the interruption from 800 to 1200. For all superficial lesions a medium soft tube was used; for deeper tissues a fairly hard tube proved more efficacious and safer. Lead plates were used to protect the patient. As a matter of convenience and for the better protection of the tissue immediately about the area treated, the latter was exposed through an opening in a small disk of lead, which was closely fitted to the surface and fastened with pieces of tape or adhesive strips. A much larger flat sheet of lead, with an opening smaller than the area covered by the first lead disk, is supported by an adjustable rest between

the patient and the tube. Each lesion treated has its individual small disk of lead, while the large sheet answers for a number of areas of about the same size in the same or different patients. The head, if lesions on it are to be treated, is supported by a photographer's rest.

As to the susceptibility of different persons to radiotherapy, after all is said, the important fact remains that the only safe guide at present is the reaction obtained in each case.

In phototherapy, Sequeira's modification of the Finsen light is probably the better. In it the carbons are brought within two or three inches of the area to be treated. Ten or fifteen minutes' exposure thus produces as much reaction as an hour's exposure by the original Finsen apparatus. The patient is protected from the light by a hollow shield, in the center of which are two rock-crystal lenses, front and back, between which cold water constantly circulates and absorbs all heat rays. The part to be treated is rendered anemic by pressing it firmly on the face of the front lens. The reaction after treatment with the lamp occurs in from six to twenty-four hours, and may vary in degree from an erythema to a vesicular or bullous dermatitis. No inflammation of tissue deeper than the skin is produced. The induced inflammation usually subsides in from three to ten days. In normal skin the reaction is followed by pigmentation, which acts as a protection against the light rays, so that in a given area successive treatments are followed by a constantly diminishing intensity of reaction. In morbid tissue the protective pigment is much less marked or entirely absent.

In effect the lamp light differs decidedly from the *x*-rays in the following particulars: Reaction occurs promptly; it is always superficial; it leaves a pigmentation; and the final results are apparent usually within a short period of time. With the *x*-rays the reaction is much slower in appearing, from one to two or even three weeks; it frequently involves deeper tissue; the normal integument, once the seat of distinct reaction, is usually much more sensitive to subsequent exposure; and, finally, the effects of the radiation are frequently prolonged through several months after the last exposure.

POSTOPERATIVE RETENTION OF URINE AND ITS RESULTS.

TAUSSIG (*Münchener med. Wochenschrift*, Oct. 7, 1902) made a careful study of all the patients on whom gynecological operations were performed at the Bettina pavilion during the years 1899 to 1901, with the object of determining the cause and results of postoperative retention of urine.

Operations were performed on 282 patients, in 60 of whom retention persisted for three days or longer, and in 43 for six days or longer.

In all these operations there was a more or less extensive separation of the bladder from its surrounding structures, and the extent of this separation in the various cases seemed to bear a direct relation to the frequency with which retention developed.

In the cases of prolapse operations the preceding cystocele with its accompanying muscular relaxation could be held accountable for the postoperative retention.

Carcinoma of the uterus *per se* could not be considered responsible for retention after operation, but in 54 cases in which the growth was removed by the abdominal route and a wide dissection was made for the purpose of removing the lymphatic glands, the retention persisted over three days in 40 and over six days in 35 of these cases.

The removal of the lymph glands in themselves could not have caused this high percentage of cases of postoperative retention, and it is extremely doubtful if the nutritive disturbances following the free dissection of the tissues around the bladder could have caused it, because repeated microscopical examinations for the first week after operation showed that the urine was always clear and comparatively free from cellular elements. A circulatory disturbance should have caused an exfoliation of the bladder epithelium and an outpouring of leucocytes and red blood cells. Evidence of cystitis in these cases did not make its appearance until the sixth to the eighth day after operation, and then it could be ascribed very justly to the continued urinary retention.

In order to still further exclude the possibility of the retention being due to disturbances of nutrition in these cases, the

peritoneum was carefully replaced over the bladder in four patients in order to increase its supply of blood, but in spite of this procedure retention occurred the same as in the previous cases. It therefore seemed highly improbable that the wide extirpation of the parametrium and the paravesical tissues with their contained vascular and lymphatic vessels had occasioned the retention by means of nutritional disturbances, and attention was then directed toward the nervous mechanism of the bladder.

Serial sections of the tissues removed at the time of operation in thirty cases were examined microscopically, and numerous nerves and ganglia were found which, from their position, must have belonged to the vesical plexus. It therefore seems justifiable to assume that the retention may have been caused by the disturbance of the vesical innervation. Against the assumption that this disturbance could give rise to retention, might be quoted the animal experiments of Zeissls, in which division of the trunks of the nerves supplying the bladder failed to cause retention, but inasmuch as the ganglia were not excised in these experiments the cases are not analogous.

Goltz and Ewald caused retention in dogs by removing the sacral and lumbar portions of the spinal cord, so that in every case the bladder had to be emptied for a long time by expression. The condition of retention gradually subsided, however, and the dogs again became able to urinate spontaneously. The above authors explained these experiments by stating that although the sympathetic ganglia were not excised the nervous shock of the spinal operation caused a temporary suspension of their function, which was ultimately reëstablished.

Urinary retention after the cancer operations can be explained in a similar manner. Those vesical ganglia which were not removed had to recover from the effects of the operation before they were in a condition to regulate the functions of the bladder.

The milder the operation in these cases, the shorter was the duration of the retention. In twelve cases in which spontaneous urination returned within six days, the extent of the disease was very limited in eleven, and the parametrium was infiltrated in the one remaining case.

The development of the cystitis was an unavoidable result of the urinary retention and the frequent catheterizations notwithstanding the fact that the strictest antiseptic precautions were observed. Catheterization, however, was not the only factor concerned in producing the infection of the bladder. Animal experiments have proven that under certain conditions bacteria can pass directly from the intestines into the bladder.

In one of the above cases the patient did not develop retention after operation, but on the tenth day the urine, which had previously been clear, became distinctly cloudy, and on examination was found to contain large numbers of bacteria and but very few epithelial cells and leucocytes. Inoculation of agar plates showed the presence of a pure culture of a bacillus belonging to the coli group.

In twelve of the carcinoma cases frequent bacteriological examinations of the urine usually showed that during the first few days after operation the urine was either sterile or only a few colonies developed on the agar plates. On the sixth to the eighth day, however, there suddenly appeared a marked increase in the number of bacteria. As a rule the cultures contained only one form of bacteria. The staphylococcus pyogenes aureus was found in seven cases, the bacillus coli communis in six, and the streptococcus pyogenes in one, while in two of these cases there was a mixed infection.

Many different procedures were employed to overcome the condition of retention in these cases. Intravesical faradization as recommended by Frankl-Hochwart and Zuckerkandl appeared to act favorably in some cases, especially those in which the condition was one of partial retention.

In two cases spontaneous urination was established by simply waiting for thirty hours after operation. Thinking that stretching of the internal urethral sphincter would lower the tone of that muscle and thereby facilitate the spontaneous evacuation of the bladder, the author dilated the urethra to the size of a finger in five cases. With three patients this treatment gave no result, but the other two urinated spontaneously the following day.

The two latter procedures appear worthy of further trial. In most of the cases the patients were able to urinate as soon as they were out of bed.

Cystitis occurred so frequently in these cases of retention that irrigations of protargol were tried as a prophylactic measure, but without much if any success.

Urotropin gave the best results of any of the remedies tried internally. It acted most favorably in the cases of simple bacteriuria.

In cases of severe cystitis urotropin did not produce much effect, but the reason for this is probably due to the fact that the drug did not come in very intimate contact with the bacteria, for the cystoscope showed that even after copious flushing of the bladder its walls were still covered with a thick coating of pus and mucus, which effectually protected the bacteria.

Irrigations with the various silver salts gave the best results in the treatment of the cases of severe cystitis. The mild cases of postoperative cystitis were usually cured in one to two weeks, and the severe cases in two to four weeks.

ABDOMINAL EMERGENCIES—TREATMENT.

In an address on the treatment of abdominal emergencies, MORISON *(Lancet,* Jan. 31, 1903) insists that the proper treatment is early operation. This depends greatly on the general practitioner, who must be fitted to diagnose surgical conditions.

The first duty of the practitioner on seeing an abdominal emergency case is to arrive at a definite conclusion as to whether or not it is a calamitous case. This will not take long if a person previously in ill health is suddenly reduced by agonizing abdominal pain to a condition of serious collapse. When this has been settled, but not till then, one-third of a grain of morphine should be injected hypodermically. The next step is to arrange for an operation without a moment of delay. The chances of recovery are best when the patient can be conveyed to a hospital. If delay is made to try the effects of morphine and hot poultices the result may prove disastrous. A mortality rate of, say, ninety per cent can be reduced by early operation to one of not more than ten per cent.

Of abdominal emergencies, the prevention of septic infection of the peritoneum easily occupies first place, for about ninety per cent of the deaths in the larger group of cases are due to this infection.

A fair percentage of patients with general peritonitis who have lived over the fourth day can recover, and no case is hopeless in which the abdomen, though distended, is not tense. A patient with a tense and much distended abdomen rarely if ever recovers. At the end of a few more days such immunity has been acquired that in the third week of a sickness due to appendicitis a patient whose peritoneum, when opened, was found to be charged with pus and feces has got well.

Operation when once the abdomen has become distended is too late. If operation is decided against, the first step indicated is to stop the administration of all food and drink by the mouth, and to give the required nutriment and fluids by enema. The next is to wash out the stomach with abundance of hot water as frequently as vomiting is troublesome. The most efficacious method of doing this is through the stomach-tube. As a substitute, a pint of hot water or a pint of champagne may be offered as a drink. The third necessity is to keep the patient perfectly quiet; for this purpose small and repeated doses of morphine are administered hypodermically. A linseed meal poultice large enough to cover the whole abdomen should be applied for an hour and repeated every eight hours, abundance of heated cotton-wool being substituted in the intervals between the poultices. A good nurse is also an essential.

Another class of cases which may be termed "grave" begin suddenly with severe pain and vomiting, but shock is moderate in degree. Under this heading may be included small perforations of the stomach, perforations of the intestines and vermiform appendix, acute intestinal obstruction, ovarian cyst with twisted pedicle, and some acute gall-stone cases. The treatment of the most serious of these cases is immediate operation.

Less serious cases may be designated

"serious" cases, and these are the most ordinary. There is severe abdominal pain, the patient may be very ill, but there is no evidence of immediate danger. The general aspect and the pulse are good. The skin is warm. In such cases the keenest effort should be made to form as accurate a differential diagnosis as possible. A correct decision may be rendered if due care be taken to listen to the history of the illness, to note the physical signs, and to balance the problems suggested by both. The most difficult cases to give a decision upon are those of suspected intestinal obstruction. If the pain is severe and paroxysmal and has been attended by vomiting and wind-rumblings and visible or palpable peristaltic movements of the intestine, making the diagnosis definite, immediate operation should be the rule. If the diagnosis is less certain, one-quarter of a grain of morphine injected hypodermically may be ordered. If the symptoms are removed by this and do not reappear after eight hours the condition is probably due to nothing serious, nevertheless a dose of castor oil and an enema should be given to clear up the remaining difficulty. If the case is one of intestinal obstruction, acute symptoms of obstruction are produced, and operation should be undertaken at once.

The experienced practitioner has seen recovery ensue in the most formidable looking cases of obstruction under the ordinary routine treatment with opium, enemata, etc., but it must be remembered that in acute cases the mortality without operation is not less than eighty per cent. When the small intestines have been allowed time to undergo considerable distention the best chance for the patient is not given by operation. In this class the most common forms of appendicitis and gall-stone cases may be placed. The risks of removing the acutely inflamed appendix have been exaggerated. It may be done in every acute case, and the patient should recover unless a diffuse peritonitis, already present, has secured too strong a hold to be remedied by the removal of the cause. The presence of a definite tender tumor following an acute attack denotes with certainty the formation of an abscess in connection with the vermiform appendix, and the only satisfactory treatment for this is to remove the appendix and to drain the abscess. Abscess may be regarded as an opportunity lost. In many of these cases of abscess the patients get well if left alone, the pus usually finding its way into an adjoining adherent coil of intestine, but operation is safer, as rupture of the abscesses into the peritoneal cavity is not impossible.

Some cases of gall-stone come under the heading of desperate conditions more frequently than can be known, unless operations are performed or post-mortem examinations are obtained. Unless a stone has got into one of the liver ducts, jaundice of course is not a symptom. This is apt to be forgotten. If gall-stone surgery is to show better results in the future than in the past patients must be operated upon whilst the stones are still confined to the gall-bladder, from which they can be removed by a safe and simple operation.

Mistakes in diagnosis will be encountered. Pain attending chest inflammations may be referred to the abdomen, and produce symptoms closely simulating those of acute peritonitis. Error may be made in other cases, usually patients at or past the middle age, suddenly seized with all the symptoms of an acute abdominal illness, so definite that a diagnosis of ruptured gastric ulcer, intestinal obstruction, strangulated hernia, or some such lesion, followed by peritonitis, may be made. The abdomen may be more or less rigid and more or less distended. Post-mortem examination in typical cases shows only an increase of fibrous tissue in the kidneys, which are granular on their surface and adherent to their capsule. The curious, gray, apathetic look of the patient, with urine of low specific gravity, and sometimes containing blood and albumin, suggests exclusion of the form of kidney mentioned, before making a definite diagnosis of abdominal disease.

INFLAMED BLOOD-VESSELS—BLOOD-LETTING.

Sincere regret is expressed by BODENHAMER *(New York Medical Journal*, Jan. 17, 1903) that the practice of leeching is rapidly passing without being replaced by as valuable a procedure, especially for the remedy of congested and inflamed

hemorrhoidal blood-vessels and tumors, and for other affections.

It is a well known fact that nothing yet has been found so complete, so prompt, or so efficient as bloodletting in pleuritis, pleuropneumonia, and in sunstroke.

Leeching may be employed as a partial substitute for venesection. This in the anorectal region is not only valuable in the successful treatment of those two organs, but is equally efficacious in the alleviation and cure of other affections.

It was in consequence of the large number of veins which accompany the arteries and expand around the rectum and anus, and which so largely contribute to the formation of the portal system, that the anorectal region was long ago selected as the proper place for leeches to produce their greatest effect in chronic or in inflammatory affections of the liver, the spleen, the colon, the rectum, and the contiguous organs. They not only diminish the general volume of the blood, but by unloading the hemorrhoidal blood-vessels operate more directly upon the affected parts. Their influence upon the general circulation is, indeed, far greater than is usually imagined.

If internal hemorrhoidal tumors are protruded, inflamed, and swollen, as well as the contiguous parts, the application of leeches is highly beneficial in subduing the severe inflammation and removing the engorgement and tumefaction. The leeches, however, should not be applied to the prolapsed, congested, and inflamed tumors, nor should they be placed within the area of the inflammatory surface surrounding the anal region, but on a place sufficiently distant from the diseased or affected parts, yet near enough to secure derivation. It has been the usual practice heretofore to apply the leeches directly to the tumors themselves in such cases, with the expectation of disgorging them by the local evacuation; but the effect is just the reverse, for the local irritation produced by the leech bites is of itself sufficient to attract and to augment the flow of blood and other fluids to them, thus preventing derivation. For a similar reason, in certain affections of the feet, the blood should not be abstracted from them by venesection, but from the arm, which is derivative. After carefully investigating the various places outside of the affection under consideration, to apply the leeches, the writer has come to the conclusion that the lumbar region has superior advantages, and to it the leeches should be applied in all such cases. From five to fifteen leeches may be applied, according to the condition of the patient, and repeated daily until all the inflammation is allayed, and he is relieved. Now if such tumors are of long standing, and are regularly organized, they should, after the inflammation has been subdued, at once be removed surgically.

JACKSONIAN EPILEPSY—TREPHINING.

Two cases of Jacksonian epilepsy cured by trephining are reported by ENGLAND in the *Montreal Medical Journal* for January, 1903.

The first patient, when nineteen, was hit on the head with a baseball bat. This produced a good-sized scalp wound over the right parietal region which bled freely. He remained in coma for the next five days, at the end of which period, while he could recognize his friends and understand them, he could not speak in reply, nor could he write properly. Later he recovered speech, but there were symptoms present. Nine months later he developed an epileptic fit that came on with an aura. Other fits of a like nature followed.

The aura was first felt as a marked numbness and tingling in the left middle finger, which gradually became flexed. Next the other fingers contracted, then the wrist and elbow and the muscles of the face began to twitch, and the whole body became involved in clonic spasms. Finally the patient lost consciousness.

The convulsions becoming more frequent and severe, surgical interference was decided on. The brain beneath the exposed dura was seen to be discolored, and the middle meningeal artery only remained as a cord and did not pulsate. The cortex of the brain was depressed. The dura mater was incised and reflected downward, some adhesions being found between it and the disclosed area beneath. The diseased brain, of a chrome-yellow color, was depressed, and did not pulsate. On incising into its center, about two drachms of a thick brownish fluid, with some débris, escaped.

The diseased area was dissected away working toward the healthy cerebrum, care being taken not to cut too deep into the brain substance that looked normal. There was slight bleeding during this stage of the operation, but it was easily controlled by a few fine silk ligatures. The cavity left was conical in shape with its apex directed inward; its base was about half an inch by two-thirds of an inch in diameter, and its depth about one-half inch. The cavity having been carefully washed out with sterilized water and dried, the reflected dura mater was replaced and sutured with fine silk. There was no suppuration, and the wound healed by first intention.

Though during the two months in the hospital there were four auras, the paresis of the hand became less marked, and directly after the operation. The tactile sensation became gradually normal after the second dressing, fourteen days after the operation. The memory and general expression improved.

Over a year after this operation a second trephining had to be performed, when it was seen that a large piece of bone had grown, taking a downward curve, pressing on the brain. The new bone—a fragment replaced at the time of operation—was necrotic in places. Perfect health ruled after this operation.

In this case it is evident that there were two hemorrhages, one extra-meningeal, from the middle meningeal artery, which may have been small; and another from the middle cerebral artery into the motor area. After his experience in this case England ceased to replace fragments of bone removed, preferring the use of the chisel to reflect a flap of bone, together with the muscles and pericranium left attached, subsequently replacing it, or using a trephine and leaving the bone out.

The second case reported was that of a male, aged sixty-three, who received a slight scalp wound where the frontoparietal region of the left side of the head came in contact with a stone, after the patient had been thrown from a wagon. A wagon wheel passed over the opposite parieto-occipital region, raising a hematoma. The patient was momentarily unconscious, but drove home in a dazed state.

In about a week he began to do light work, and continued at this for three months. Then he found himself getting weaker mentally and physically. He became irritable and solitude-loving. There was much suffering from headache from the first, the pain gradually becoming more severe and constant.

The pain was of a thumping nature, and was felt in the left parietofrontal region. About once a day there was an exacerbation of this pain. The pain usually ran down the right arm into the forefinger, where it would remain for hours. It was followed by numbness in the arm and finger. With these severe attacks there was an inability to walk, and the only relief secured came from the application of ice to the head.

An examination showed no deformity of the cranium. Around the center of the left frontoparietal suture was an area of tenderness. On pressure the patient experienced a sensation as if a pin were being run into the scalp. Over this area on the scalp a thick, brown, gummy excretion was present.

About eight months after the injury the skull was trephined. The cranium over the posterior part of the left middle frontal convolution, and over the leg and arm motor centers, was removed. The upper part of Broca's convolution was also exposed, and the lower part of the first frontal convolution. On excising the dura the brain was seen to completely fill the cranium, but it did not pulsate. No depressed bone or spicula was found. The subarachnoidal space was much distended and gave a milky hue to the surface of the brain. This space was broken into and about two ounces of cerebrospinal fluid escaped, with immediate collapse of the central part of the area exposed. The brain immediately around this area pulsated.

On free exploration of the posterior part of the second frontal convolution, more fluid escaped. There was either an indefinite cavity beneath it and in the surrounding convolutions for about one inch in all directions, or cerebral softening. There was no distinct cyst wall present. The brain remained collapsed. A silkworm-gut drain was inserted into its interior, as well as a second drain between the dura and the skull. The cut dura was

sutured up with catgut and the scalp with silkworm-gut, the bone not being replaced. An antiseptic dressing was applied.

For the first few days after the operation the patient experienced some difficulty in articulating, but later completely regained the power of speech. He completely regained power in his right arm and leg. He has had no pain in the head since the operation.

Relief of intracranial pressure cured the pain, though the case is reported so shortly after operation that this cure cannot be regarded as permanent.

SURGICAL OPERATIONS—MICROSCOPIC AID.

A paper by EDEBOHLS *(Post-Graduate,* January, 1903) is intended to encourage the more general use of the microscope during operations performed at the homes of patients as well as in hospitals.

The immediate examination of uterine scrapings during curettage may in doubtful cases frequently determine the question of malignancy or otherwise. In growths involving the uterus, for instance, that organ may be removed without subjecting the patient to delay and a second operation.

The nature of tumors affecting various abdominal and pelvic viscera may be absolutely determined with the miscroscope, saving at times much perplexity and uncertainty. Tumors in other parts of the body may be examined and diagnosed accurately by the same means.

The microscope is exceedingly valuable in determining the malignant or benign character of a tumor of the breast. The tumor is first excised, and is then handed to the microscopist. On his immediate report depends the question as to whether simple excision of the tumor or amputation of the breast will suffice, or whether the more or less extensive removal of muscles and the tedious clearing out of the axilla will have to be added.

Edebohls cites one instance where he found immediate examination of frozen sections, in operation upon the kidneys, necessary to determine whether he was dealing with chronic interstitial nephritis or acute miliary tuberculosis. In two further instances the instrument determined the question of renal decapsulation or nephrectomy.

On one occasion appeal to the microscope was found necessary to decide between tuberculosis and miliary abscesses of the kidney or acute suppurative pyelonephritis.

In the discussion of Edebohls's paper it was remarked that while the microscope is of considerable value to the country practitioner, it is of less service than a knowledge of gross pathology.

Examination of pus during abdominal operations, once so popular in Germany, has fallen into disuse, because operators have become convinced that even the most virulent collections in the lower abdomen can be evacuated and the adjacent tissues so thoroughly cleansed that the abdomen can be closed without any bad effects to the patient, and even with primary closure of the wound.

RHEUMATIC FEVER—SURGICAL TREATMENT.

In the condition commonly understood as rheumatic fever, acute rheumatic arthritis, or acute rheumatism, O'CONOR *(Lancet,* Jan. 24, 1903) is certain that surgical treatment is most efficacious, not only in causing immediate disappearance of the arthritis and early cessation of general toxemia, but also in effectually protecting the heart against attack. Sight is not lost of the great value of salicylic acid as a cure, but while many cases seem to derive benefit from the administration of this remedy, a considerable number seem to be unaffected by it, and on many occasions also O'Conor has seen the onset and establishment of endocarditis during the full physiological exhibition of the drug. Surgical treatment is not, however, held to be a panacea for all forms of the disease. Proof has been presented of its futility in chronic cases, particularly in those of a dry variety, the result of prolonged packing of synovial membrane and vessels in infective material. It is maintained, however, that removal of the infective material as soon as possible from the infected joints is a scientific and rational method of treatment, a conclusion fully corroborated by results.

It is hardly necessary to observe that,

as in pyemia and gonorrheal arthritis, the extent or intensity of metastatic lesions may be out of all proportion to that of the primary focus of infection; yet no matter how trivial the signs of the latter may seem, it is necessary to deal radically with it before hoping effectually to overcome the former. Attention is invited to a form of infective watery cellulitis which not infrequently appears to be the dominant manifestation of the disease about the ankle- and wrist-joints. Sometimes this is found associated with evidence of arthritis of the corresponding joints and sometimes not. Multiple incisions effect a prompt cure.

While advocating early surgical interference in rheumatic fever O'Conor cannot too strongly deprecate any attempt at the same without the operator feeling assured that he commands all the ordinary essential elements with which to carry out an ordinary aseptic operation. It is obvious that under septic conditions this method of cure might readily be attended with greater disasters than might even originate from the disease itself. To any one about to put this practice to the test these suggestions are offered: (1) do not puncture, open knee-joints; (2) ligate all bleeding points; and (3) drain, do not cork. Also insistence on the great value of thorough drainage in these cases is made, for it would be a more imbecile act to close a joint containing such toxemic stuff than to seal hermetically a recent ischiorectal abscess cavity. In order to carry this properly into effect in operations on the knee-joint an incision an inch long is made on each side of the joint through the capsule. Through both openings a long closed forceps is passed and a fenestrated india-rubber tube half an inch in diameter is drawn across the synovial pouch, leaving about half an inch of tubing presenting at each wound. Drainage having been thus secured, the joint is washed out every morning with a jugful of warm carbolic lotion (1 in 60), and the tube is generally dispensed with on the third or fourth day. Irrigation of the joint is daily continued until healing no longer permits of the passage of fluid. A little superficial necrosis of wound tissue caused by pressure of the drainage-tube need not excite alarm, as this rapidly disappears under an iodoform gauze dressing. The latter, by the way, is made fresh for each dressing by immersing pieces of dry sterilized gauze in a solution of equal parts by weight of iodoform, alcohol, and glycerin. A little formalin (1 in 500) is added to the mixture before use. In arthrotomy of the wrist- and ankle-joints drainage is attained by a piece of gauze passed into the joint through the open blades of a dressing forceps previously inserted.

VASCULAR NEOPLASMS—INJECTIONS OF WATER AT A HIGH TEMPERATURE.

For the last two years, WYETH *(New York Medical Journal,* Dec. 6, 1902) has treated a number of cases of vascular neoplasms, of the three varieties, by directly injecting into their substance water having a temperature of 190° to 212° F. and over. The results justify a trial of the method in similar cases.

There is employed a syringe with a metal cylinder and adjustable piston, with needles of varying size. Under the ordinary aseptic precautions boiling water taken direct from a cauldron is injected. The quantity of water employed and the temperature should vary with the size and character of the neoplasm. In the arterial and venous tumors of large size the needle is thrust deeply into the mass, and from thirty to sixty minims of water is forced out. It is then withdrawn from one-half to one inch, and this operation is repeated until the entire tumor is solidified. The water should be hot enough to immediately coagulate the blood and the albuminoids of the tissues, but it should not be forced in so extremely hot and under such pressure as to scald and to produce a necrosis of the skin. When the tension is sufficiently great to cause a slight bleaching of the integument, the injection should be discontinued in that area.

In treating the capillary nevi, or "mother's marks," situated upon important structures, such as the eyelid, nostril, and margins of the lips, a small instrument with a delicate needle should be employed, and water a little below the boiling point (about 190° F.) is preferable. Not over two to six minims should be injected in a single puncture, and the treat-

ment should start from various points at the periphery, the operator watching closely the effect of the first injections, and after a week or ten days repeating them as may be indicated. Water at a very high temperature is apt to produce slough in the capillary variety.

In cirsoid aneurism and the large cavernous nevi, the water should be boiling, and should be kept at the boiling point while the instrument is being used. For this purpose a long metal instrument has been devised, beneath the barrel of which a Bunsen burner is held while the operation is being done. In this way the high temperature of the water is maintained within the barrel of the syringe.

The operations are performed under complete narcosis, and in no instance has any painful symptom or septic reaction ensued, with the exception of a single case, which became infected later from a superficial eschar. Suppuration ensued, but the beneficial results of the treatment were the same as in the other cases.

Wyeth advises special caution in treating angiomata of the scalp and neck, on account of edema.

DIABETICS—SURGICAL TREATMENT.

The few scattered articles in current literature, relating to glycosuria in surgery, have been collected by FOWLER (*Maryland Medical Journal*, February, 1903) for the purpose of arriving at practical conclusions on the subject.

Operations may be divided into two main divisions—operations that are urgent, and those of no immediate necessity. As examples of the former may be mentioned strangulated hernia, hemorrhage, injuries, and acute suppurative appendicitis.

In conditions coming under the first division, perform the operation which will require the shortest time and will produce the least shock. Ether should be used for general anesthesia, never chloroform. The after-treatment is the same as for the second group.

Considering the second division, the factors that determine the advisability of operating are the condition of the patient, the value of the lesion, and the gravity of the operation demanded.

Fat patients are the most favorable surgical subjects. In young patients a trivial operation is not uncommonly followed by a rapid development of coma and death, while in older patients coma develops usually only after severe and prolonged operations. Alcoholics with diabetes are notoriously bad surgical subjects. The indications for operation on these cases must be most urgent to justify surgical interference. In cases of long-standing diabetes, structural changes have undoubtedly occurred which diminish resistance and make the prognosis less favorable.

Previous antidiabetic treatment is beneficial and should be instituted in every case before operation. It tends to prevent the development of coma.

There is a difference of opinion concerning the value of the presence or absence of knee-jerks in prognosis.

The great danger of operation is infection; the strictest asepsis is essential. It is interesting to note that operations about the mouth do very well, while those about the penis are exceedingly dangerous.

The simple operation of circumcision should never be done without first examining the urine for sugar. When diabetes exists the operation should be performed only when the indications are urgent, and then with the utmost precaution.

Gangrene of the extremities is not wholly dependent upon the diabetic condition, but rather upon associated vascular and nervous changes. Wallace would make diabetic gangrene a subdivision of senile gangrene—senile gangrene complicated by diabetes—and points out that, as in senile gangrene, the most constant pathological condition in the diabetic form is arterial degeneration. Treatment of the two forms should therefore be similar.

The chief etiological factors of gangrene of the extremities occurring in diabetics are (1) traumatisms, often of very slight extent; (2) arteriosclerosis; and (3) nerve degeneration.

Statistics show that in gangrene of the extremities the high amputation is the only method of treatment likely to give satisfactory results, except in those cases in which two or three toes only are affected and where symptoms of general septic poisoning are absent.

Wallace believes that the fear of local sloughing is without foundation, and that if the amputation has been high enough to secure healthy blood-vessels, the flaps may be expected to heal well.

The patient should be given large doses of sodium bicarbonate just before the administration of the anesthetic, as this aids in preventing the development of coma.

FEMORAL HERNIA—DIAGNOSIS AND OPERATIVE TREATMENT.

There are many conditions which may simulate femoral hernia in one or other of its forms, and these conditions are outlined by FOWLER *(New York Medical Journal,* Dec. 6, 1902), who also describes the Fabricus operation, the only variety of operation for the treatment of femoral hernia with which he is familiar, but which is uniformly satisfactory.

Femoral hernia develops slowly, is more common in females than in males, rarely occurs before the age of puberty, and rarely attains a large size. It causes less disturbance than inguinal hernia, and hence is more frequently overlooked by the patient. Indeed, it may happen that attention is only drawn to the femoral region when strangulation has occurred.

Reducible femoral hernia is characterized by a soft, inelastic, reducible tumor, lying to the inner side of the femoral vessels and possessing an expansile impulse. Its diagnosis from incomplete reducible inguinal hernia rests upon its relation to the surrounding parts and the direction in which it can be reduced. In femoral hernia, Poupart's ligament can be recognized above the tumor; in inguinal, the ligament is below the tumor. In fat persons it may be difficult to mark out the ligament. The pulsation of the femoral artery can be felt to the outer side of a femoral hernia, below in the case of an inguinal hernia. Femoral herniæ are reduced in a backward and upward direction, inguinal herniæ in an outward, upward, and backward direction.

Psoas abscess pointing in the femoral region offers several points of similarity to reducible femoral hernia. The impulse of hernia is marked and expansile; in abscess it is neither expansible nor marked. The previous history in abscess of gradually increasing pain in the back and loin along the course of the iliopsoas muscle, and the characteristic posture due to contraction of the iliopsoas, are important aids. Most important, however, is the relation of the swelling to the femoral vessels. In hernia the vessels are to the outer side, in abscess they are to the inner side.

In irreducible femoral hernia there is an irreducible, ovoid, smooth swelling in the groin, usually about the size of a hen's egg, or somewhat smaller, and located at the inner side of the femoral vessels. On palpation it is semielastic, almost fluctuating. If omentum is present the percussion is dull; if intestine, resonant.

Irreducible femoral hernia is diagnosticated from incomplete irreducible inguinal hernia by a careful examination of the anatomical landmarks in the neighborhood. In addition, the axis of inguinal hernia is oblique, following the course of the inguinal canal, while the axis of femoral hernia is transverse to the long axis of the thigh.

The best method to distinguish femoral from inguinal hernia is to draw a line from the anterior superior iliac spine to the pubic spine. The first is easily identified, but the second is at times difficult to locate. This is particularly true in fat individuals. It may be determined in the male by invaginating the scrotum; in the female by abducting the thigh, thus putting the adductor longus on the stretch, and following this muscle to its attachment just below the pubic spine. A simpler method, however, and a reliable one, is to pass a tape around the body so as to lie upon both trochanters. The tape will cross the pelvis at the level of the pubic spine. Having drawn a line from the pubic spine to the anterior superior iliac spine, note whether the larger portion of the hernia lies above or below this line; if above, we have to deal with an inguinal, if below with a femoral, hernia. The one exception to this rule is scrotal hernia, which is easily recognized.

Irreducible femoral hernia need not be confounded with either psoas abscess or saphenous varix. In the latter case the swelling can be made to disappear, as is also the case in psoas abscess at some stages of its development.

From femoral adenitis the diagnosis is

not so easy, as not infrequently an enlarged lymphatic gland occurs in conjunction with femoral hernia, and, by overlying it, masks the hernia. In acute adenitis the swelling is painful, and the overlying skin is reddened and tender.

Femoral lipoma is distinguished by its position, which is anterior, and in many cases external, to the femoral artery; by the absence of impulse on coughing; and by the ill defined outline of the tumor.

Malignant tumors sometimes occupy the region of the groin and have been mistaken for hernia.

Cysts developing in the superficial fascia overlying the femoral canal are rare. They may closely simulate irreducible femoral hernia.

Radical Operative Treatment.—(1) The incision is planned so as to expose the insertion of that portion of the aponeurosis of the external oblique known as Poupart's ligament, at the spine of the pubes, and the line where that structure blends with the fascial structures of the thigh, as well as the sheath of the vessels at the crural opening. (2) The sac of the hernia is exposed and cleared to its neck. (3) The sac is opened and emptied, after which it is ligated at its neck, and the latter, in suitable cases, is inverted toward the abdominal cavity. (4) The edge of the aponeurosis of the external oblique is forced backward to the level of the upper margin of the horizontal ramus of the pubes, and there sutured to the periosteum and the origin of the pectineus muscle. By this means the space between the bone and the downward projection of the aponeurosis, in which space a femoral hernia forms before making its appearance externally, is obliterated.

The patient is placed in the Trendelenburg position, the intestines thus being caused to gravitate to the upper portion of the abdominal cavity. The incision commences at the spine of the pubic bone, and is carried parallel with Poupart's ligament for a distance of from four and a half to five inches, or sufficiently far to reach a point well to the outer side of the femoral vessels. The skin, fat, and superficial fascia are divided, the superficial epigastric vein, as it passes in a vertical direction, being sometimes sufficiently large to come into sight before division, in which case it is divided between two ligatures.

The hernial sac, in some instances, projects directly beneath the lesser falciform process, in which case it comes into view with its coverings at this stage of the operation. In other cases, however, it lies beneath the superficial layer of the deep fascia of the thigh, or the fascia lata, as it is called, because of its broad ramifications. Under these circumstances it will be found to be covered by the cribriform fascia, which must also be incised.

The sac being exposed and isolated well down to its neck, it is opened and its contents reduced.

In order to more fully expose the crural canal preparatory to its obliteration, the attachment of Poupart's ligament at the spine of the pubes is first detached, and the separation carried on in an outward direction until this structure is separated from the superficial layer of the fascia lata up to the crural sheath. At the latter point, although this layer of the deep fascia of the thigh is somewhat tense, yet it does not lie directly upon the vessels. With the index-finger introduced to guard the vessels, the separation of the fascia lata from Poupart's ligament is completed with the scissors. In a strangulated case this stage of the operation should precede the one last described, for the reason that relief of the constriction follows at once when Poupart's ligament and the remainder of the aponeurosis of the external oblique has been detached and freed.

A funnel-shaped cavity, formed by the recession of the horizontal ramus of the pubic bone, is now revealed, constituting the femoral canal. This now contains the ligated neck of the sac, some fatty and areolar tissue, and a lymphatic gland or two. These latter are to be removed. In cases of old unreduced hernia, the peritoneum has been stretched and bulges forward considerably at this point. Grasping the neck of the sac, this is drawn forward and a portion of the superfluous tissues, consisting of peritoneum and subperitoneal fat, removed, a transverse peritoneal section resulting.

The gap thus made is now sutured. The edges are grasped with catch forceps and drawn forward so as to secure broad approximation of the peritoneal surfaces.

The essential and important step of the operation now takes place, consisting in attaching Poupart's ligament to the point of origin of the pectineus muscle and the periosteum of the horizontal ramus of the pubes. Poupart's ligament is thus made to describe a backward curve, to follow the recession of the bone at this point, imitating in this respect that portion of this structure which is reflected obliquely outward and backward after its insertion into the spine of the pubes, and is known as Gimbernat's ligament. In this manner the femoral canal, or space which normally lies between Poupart's ligament and the bone, is obliterated.

In applying the suture the crural sheath and its contained vessels should be displaced well to the other side and above the iliopectineal eminence, and there held with the operator's disengaged index-finger, or with a blunt hook in the hands of an assistant. In this manner an increased area for the attachment of Poupart's ligament to the horizontal ramus of the pubes is made available. The obturator artery and vein may come into view, and care should be taken not to injure these.

A stout and strongly curved needle with a sharp point is armed with a strand of kangaroo tendon, and passed through the aponeurosis of the external oblique about three-eighths of an inch from its edge, so as to secure a good hold. It is then passed through the periosteum at the point of origin of the pectineus muscle, emerging about half an inch from the point of entrance upon the upper margin of the bone.

This suturing is the most important step of the operation, and upon the care with which it is done rests the entire success of the procedure. If the periosteum and bony attachment of the pectineus are caught well up by the needle, a good hold will be secured upon these structures, and firm and solid attachment of Poupart's ligament in its new position effected. All the sutures are first laid, and after cleansing the parts each is separately and securely tied. As we proceed with the sutures toward the median line we must avoid injury to the deep epigastric artery and vein. Five or six sutures are usually required.

In order that the closure may be sufficiently solid, it is advisable, although not always necessary, to reattach the superficial layer of the fascia by means of sutures to the aponeurosis of the external oblique.

The remainder of the wound is now closed. If the superficial fascial structures reflected from the abdominal wall to those of the thigh present themselves with well marked edges, these may be sutured separately with a continuous catgut suture. Usually, however, these may be disregarded and the skin wound closed at once. This may be done by any method which the operator may fancy.

TUMOR OF THE BLADDER—SUPRAPUBIC CYSTOTOMY.

An abstract of a paper on suprapubic cystotomy in cases of tumor of the bladder, with special reference to the causes of mortality and of recurrence of the growth, by Lockwood (*Medical Press*, Nov. 26, 1902), contains some general conclusions on this subject.

The operation is much safer when the urine is acid and the tumor removable. Indeed, it seems reasonable to suppose that if shock and hemorrhage could be prevented the mortality would fall within very reasonable proportions.

The cases studied clearly show the extreme danger of suprapubic cystotomy when the urine is septic and the tumor irremovable. An operation is not justifiable under such circumstances. It is true that now and then a survivor experiences some relief from the horrors of the disease, but that relief is not worth attempting when the attempt entails a mortality of fifty per cent. Irremovable tumors of the bladder are almost invariably malignant. The ordinary course of malignant disease on any surface of the body is growth, degeneration, and sepsis. In tumors of the bladder the growth is generally accompanied by hemorrhage, which may be fatal, but in any case predisposes to septic cystitis, and indeed to general sepsis. Further, the sepsis which complicates malignant diseases is of a virulent type. While operating upon malignant diseases complicated by sepsis the freshly cut tissues are sure to be infected, and the infection easily enters the blood-stream. Lockwood does not believe that the sepsis which compli-

cates malignant disease of the bladder is more virulent than that met with in malignant disease of other regions, but owing to the proximity of the ureters and kidneys, of the pelvic veins and cellular tissue, and of the peritoneum, it has unusual opportunities for doing harm.

It may be assumed that a good many tumors with thin pedicles have been thought innocent, especially in the absence of a microscopical examination. But it is now known that the thickness of the pedicle is not a trustworthy guide to the characters of the growth. Perhaps the slender-stalked villous papillomata may be an exception, but even they are at times associated with malignant growth. The extreme frequency of malignancy in tumors of the bladder, and the fallacy which underlies the naked-eye appearances, have an important bearing upon the methods of treatment.

Clearly, the proper time for operation is (1) before the growth is too extensive for removal, and (2) before sepsis is established. Both of these requirements are fulfilled by an early diagnosis, which can in nearly every case be achieved. The growth would be seen if the bladder endoscope was systematically used after the occurrence of sudden spontaneous hematuria. Hematuria is the commonest and earliest symptom of bladder tumor. In two, in which it was supposed to be absent, the urine was not examined with the microscope. In about one-quarter of forty-three cases studied the blood was accompanied with pain; in about three-quarters the hematuria was preceded, accompanied, or followed by other symptoms, such as pain during and at the end of micturition, pain in the back, abdomen, rectum, vagina, root or end of penis, pubes, rectum, perineum, and neck of bladder. Sometimes the hematuria was preceded by increased frequency of micturition, and sometimes was followed by retention or incontinence. Bits of growth were occasionally passed, or the urine contained suspicious epithelial cells. The first attack of hematuria soon subsides, and may not recur for months or even years, and the patient is supposed to have recovered. The absence of pain affords a false sense of security, and is an additional cause of delay in using the endoscope.

As to the details of operation, each step in the removal of the growth should be guided by the clearest vision, and for this a full-sized suprapubic opening is required, aided by efficient retraction of the edges of the wound and by the use of an electric forehead lamp.

Next as regards the removal of the tumor. Of late years a great deal of evidence has been accumulated, especially from the results of accidental wounds during laparotomies, or accidental rupture of the bladder, to prove that wounds of the bladder unite well and speedily, provided that the operation is performed under aseptic conditions. The ideal operation of suprapubic cystotomy for the removal of tumor from the bladder should fulfil the following conditions: First, an early endoscopic diagnosis; second, asepsis before, during, and after the operation; third, the excision of the tumor, together with its base and a safety margin of healthy tissue; fourth, the closure of the wound left by the excision; fifth, the closure of the suprapubic wound.

In all regions of the body, when sepsis is present, it is well to use biniodide of mercury, catgut, and to provide abundant drainage. In addition, it is probable that fine catgut is the best material for all ligatures and sutures, except those in the abdominal wound, and also those which close the bladder.

Finally, it is believed that if the above five conditions were fulfilled, suprapubic cystotomy for the removal of tumors would rapidly take its place in the same rank with the other successful abdominal operations, such as cholecystotomy or ovariotomy.

DUODENOCHOLEDOCHOTOMY — TRANSDUODENAL ROUTE.

At the end of a detailed study of duodenocholedochotomy, with special reference to this operation in cases of impaction of gall-stones in the lower portion of the common duct, THIENHAUS (*Annals of Surgery*, December, 1902) presents the following conclusions:

1. The transduodenal route has a well defined place in the surgery of obstruction of the common duct produced by gall-stones.

2. Lithotomia transduodenalis, first advocated and practiced by McBurney in 1891, either after his methods (that is, with incision of the papilla) or Collin's method (that is, dilatation of the papilla), is the method *par excellence* for all cases of gall-stones impacted at or near the opening of the papilla, as soon as efforts to press the stone into the duodenum by bimanual manipulations have proved unsuccessful.

3. Choledochotomia transduodenalis is indicated for stones impacted in the retroduodenal portion of the common duct, or before the diverticulum of Vater, as soon as efforts to dislodge the stone up into the supraduodenal portion have proved futile.

4. In all cases where choledochotomia transduodenalis has been performed, it is advisable to suture the common duct to the duodenum to avoid infection (choledochoduodenostomia interna).

5. Choledochotomia transduodenalis seems to be more advisable than choledochotomia retroduodenalis because it can be more easily performed, and the integrity of the pancreas is not interfered with.

6. Statistics have not proved that transduodenal choledochotomy has a greater percentage of fatalities produced by septic infection than supraduodenal choledochotomy. Further contributions in this direction are desirable for the purpose of procuring definite conclusions. Most of the cases where sepsis was the cause of the death of the patient after an operation on the common duct were cases of infection of the bile passages before operation, and the method of operation was not responsible for the fatal result.

TIC-DOULOUREUX CURED BY INTERPOSED RUBBER TISSUE.

After an inquiry into the methods of the past and present for treating tic-douloureux, ABBE (*Annals of Surgery*, January, 1903) believes he is able to demonstrate that operations upon the ganglion have been carried on to an unnecessary degree of severity; that resection of one-fourth or one-half inch of the nerves anterior to the ganglion and within the cranium, with the interposition of rubber tissue, can be relied upon for perfect cure, up to six years at least, with probability of permanency as great as by any other method; and that this method is simple, speedy, and safe. In his five cases the results have been perfect, both as to permanence of the cure and persistence of the tissue. One case dates more than six years.

Incidentally it is mentioned that in one other case, four and a half years ago, in which the Salzer operation was performed, anterior to the skull a piece of rubber tissue was laid with reasonable accuracy over the resected nerve ends in the sphenomaxillary fossa. The patient is yet well.

The operation should not be delayed by temporizing. The external carotid artery may be ligated with advantage in controlling hemorrhage. A vertical incision over the middle of the zygoma carried through the temporal muscle to the bone divides no important nerve or vessels. The muscle is scraped to either side and held by retractors. A small opening is then quickly made by mallet and gouge, and this is enlarged rapidly and safely to an inch and a half diameter. No better exposure can be had by any incision than this simple straight one. The dura is then pressed away from the middle fossa until the nerves are exposed. The much complained of hemorrhage from venous sinuses on dissecting up the periosteum can be best controlled, and very quickly, by pressing a strip of rubber tissue upon the place with a firm pad of gauze in strips. The clotting of blood under the rubber tissue takes place very quickly, while if plain gauze is put in contact with the bleeding point, the blood being sucked up into it prevents clotting. The nerve trunks should be grasped in separate artery clamps, dividing each close to the foramen of exit, and either by cutting or by rotation of the forceps should be separated from the Gasserian ganglion.

The wound should be packed, for a few minutes, with narrow strips of iodoform gauze until dry. A piece of thin guttapercha tissue, stiff enough to be easily handled, is sterilized by rubbing with bichloride solution, and kept in salt solution for a few moments before operating. This is cut one and one-half inches long and three-fourths of an inch wide. It is laid

carefully over both the foramen rotundum and ovale, where the nerves have been separated and pressed carefully into place by iodoform gauze. In a very few minutes the gauze may be drawn away and the Gasserian ganglion allowed to settle down upon the rubber tissue. A small drainage-tube should be placed in the angle of the wound for a few hours to insure a perfectly dry healing.

It is past dispute that there is no need for the removal of the first branch of the fifth pair in any case of grave tic-douloureux unless the origin is to be found in a tumor of the Gasserian ganglion or behind it.

SNAP- OR TRIGGER-FINGER AND ITS TREATMENT.

A condition of comparative rarity is snap- or trigger-finger, four cases of which are reported by BARNARD in the *Practitioner* for February, 1903.

In a typical case of trigger-finger, there was a snapping down on flexion, and considerable effort was then required to extend the first interphalangeal joint again; indeed, on one or two occasions the middle finger had been fixed in flexion so that the patient was obliged to call in a doctor to extend it again. While the patient was making the effort to extend the joint, the terminal phalanx was quite loose and wobbled up and down freely.

One of the conditions which produce snap-finger is rheumatism, probably by producing nodules in the tendon, or leading to ecchondroses in the first interphalangeal joint. Many of the cases have been attributed to blows or to the excessive use of the finger affected. Cases are found where the condition has been caused by washing and wringing clothes. In another instance snap-finger came on after a man had been holding a heavy fishing-rod for several hours. A good number of the cases, however, arise without obvious cause.

The thumb is more often affected than any of the fingers, and then, in order, the ring, middle, little, and index fingers.

The most typical cases are undoubtedly due to changes in the tendon, producing a local enlargement which snaps below the osseofibrous arch opposite the metacarpophalangeal joint, or, in the case of the thumb, between the two sesamoid bones and beneath the ligament which unites them. Such enlargements of the tendon can not only be felt, in many cases, moving up and down with the tendons, but they have actually been seen during operation.

In two cases, where the tendon of the flexor longus pollicis was hooked out during the operation, a firm nodule was found in it, producing a fusiform enlargement, which would not slip between the sesamoid bones until the ligament between the latter had been divided.

Equally clear cases have, however, demonstrated that the cause of the snap may be in the joint. Koenig amputated such a finger, and demonstrated an irregularity on the articular surface which produced the trigger action. Walther has shown a similar specimen from an old woman; while it is clear that the lateral ligament of the interphalangeal joint, by slipping over an ecchondrosis projecting from the side of the joint, would produce a snapping action.

Many of the cases, especially those due to sudden injuries, appear to have been evanescent, and for such rest on a splint with pressure from a pad placed over the swelling, and later massage, appear to be the suitable and successful treatment.

But where there is a definite nodule which has persisted for a long time, it appears to be right to expose the tendon, and when the sheath has been opened, to proceed according to what is found—either removing the mechanical obstacle or overcoming the disproportion between the tendon and its sheath. Where synovial fringes exist, these should be removed; but where a fibrous nodule is buried in the tendon, it is better to make room for its passage up and down by removing a part of the fibrous ring. The most scrupulous aseptic precautions must be adopted throughout.

SUNKEN NOSE—SUBCUTANEOUS INJECTIONS OF PARAFFIN.

In the *Practitioner* for February, 1903, PAGET tells what he has learned from his experience in injecting paraffin to improve the appearance of sunken noses.

The paraffin should melt somewhere between 105° and 115°. Paget has tried with excellent results two paraffins, one melting at 115° and the other at 111° F. They are easy to use, setting quickly but not too quickly. They are not hot enough to do harm, while yet hard enough to stand heavy pressure.

Eckstein's syringe on the whole is the best at present, but the needle is too long, too thick, and not rigid enough. Paget uses an Eckstein syringe fitted with a straight steel needle an inch long; the body of the syringe, and the proximal half of the needle, are jacketed with bits of tubing, and there is a little washer between the syringe and the needle where they screw together.

Prepare the skin of the nose carefully, and sterilize the needles by boiling. In every case give a general anesthetic. The paraffin is melted, and is put in a water-bath, with the syringes. (It is best to have two syringes ready, in case of accident.) With a paraffin melting at 111°, the water-bath is kept at 118° to 120°. The skin is nicked with a Hagedorn's needle, that the syringe may be used quickly and lightly. The paraffin can be trusted to raise the skin better than a tenotomy knife; but if the skin be rigidly puckered and adherent at any point, from old necrosis of bone, it may be right to free it just there.

The assistant keeps up very firm pressure all round the nose, joining his fingers and thumbs in a ring, and taking the utmost care to protect the brows and the inner angles of the orbits. Five or six cubic centimeters of paraffin is drawn up into the syringe, and it is then held under the water in the bath while the screw-nut is adjusted. Then the needle is dipped for two or three seconds into water that is boiling, or just off the boil. This is better than passing the needle through the flame of a spirit lamp, which stains the paraffin, or makes it spit from the needle.

As a rule, it is best to make the injection from a point a little to one side of the middle line, below the place where the bridge ought to be, and to direct it upward, away from the tip of the nose. The needle is put well under the skin, and the paraffin is injected at or about the rate of one cubic centimeter every ten seconds. In most cases it is necessary to make more than one puncture, and the best plan, according to Paget, is to work quickly and to get in the paraffin without loss of time, so that it may all be molded together. The molding must be done vigorously; the surgeon must not be afraid to squeeze the nose hard. He must take especial care to keep it straight; to prevent the paraffin from straying to the forehead, or the eyelids, or the tip of the nose; to make the bridge fairly narrow and high, and to mold a good shape to the upper part of the nose; and to continue molding steadily for ten to fifteen minutes, till the paraffin feels absolutely rigid. The punctures are then sealed with collodion, a mask of wet lint is laid over the face, and the patient must be carefully watched out of his anesthesia, lest he turn over suddenly on his face, as has been known to happen. When he is himself again, a hand-glass is given him, and he is told to mold his nose gently, now and again, during the next few hours. No external splint is of any use.

Every paraffin, as it sets, shrinks; the hardest shrink the most. In a bottle its surface is cupped; and in microscope work the paraffin used for embedding gets cupped and shrunk. The same thing happens with these nose cases. Nearly all of them, a few hours after injection, are a little disappointing; they do not look quite so successful in bed as they did on the operating-table. Something can be done a few days later by the injection, under cocaine only, of a little more paraffin; but this is not always so simple as it sounds; the second injection still leaves something to be desired, the profile still remains a little imperfect; and the surgeon dare not do more for fear of doing too much.

The point is not to attempt this method without very careful trial and rehearsal, so one may well know how the paraffin behaves, and all its tricks of running, and setting, and shrinking; to be sure of the syringe; and to inject at a fairly quick rate a fairly large quantity of paraffin.

There have been twenty-nine cases treated by Paget without death or disaster, and the general results are very good.

There are some noses that can never be made handsome, but even in very bad cases a great deal of good can be done, thus:

1. The upper portion of the nose, be-

tween the eyes, can be raised and fashioned into fair shape in almost every case. This is an immense gain; it alters the whole look of the full face, giving a proper setting to the eyes and improving the expression of intelligence and of will.

2. The nose can be slightly increased in length.

3. The profile-line can be more or less perfectly straightened.

4. The tip of the nose can be slightly depressed, so that the nostrils look directly, or almost directly, downward.

5. In two cases reported the patient, without being asked, said he breathed more freely through his nose after the treatment.

The best cases are those in which there is plenty of lax healthy skin, a fair length of space between the forehead and the upper lip, and a fairly refined end to the nose. The worst cases of all are those in which the nose is puckered and crumpled by syphilitic necrosis, with dense cicatricial tissue, and everything is shrunken and rigid.

INCONTINENCE OF FECES DUE TO RELAXED OR PARALYZED SPHINCTER ANI.

It occurred to ROBSON *(Practitioner,* February, 1903) some time ago, when repairing a perineum torn into the rectum, where he had to pick up and bring together the widely separated ends of the sphincter muscle to cure incontinence of feces, that a modification of the operation might be efficacious in curing the distressing condition of incontinence of feces which is not infrequently seen unassociated with ruptured perineum in the male as well as in the female.

A typical example of this improved treatment is that of a woman of middle age who suffered from incontinence after an operation for piles. She was less troubled when in bed, but the incontinence was especially marked on rising from the recumbent position. On examination there was no rupture of the perineum, but the anal orifice was patulous, and there was no perceptible contraction of the sphincter when this movement was attempted voluntarily by the patient.

The following operation was performed in November, 1901: With the patient in the lithotomy position, a semilunar incision was made at the juncture of skin and mucous membrane around the anterior half of the anus, and this was deepened about one-fourth to one-half inch. The upper and lower margins were then separated by being drawn apart with forceps, so as to make the semilunar slit into a lozenge-shaped cavity; this cavity was then closed by bringing together the sides by buried catgut sutures and the skin by silkworm-gut sutures. The wound was entirely external to the bowel, and diminished the size of the anus, but it did more than merely contract the orifice, for it restored the power of the sphincter muscle.

The patient made a smooth recovery, and the sutures were removed on the tenth day. From the day of operation she was able to control the anal orifice; and when seen some weeks later she was quite well, and said that the incontinence had completely disappeared.

Reviews.

THE INTERNATIONAL MEDICAL ANNUAL. E. B. Treat & Company, New York, 1903.

The International Medical Annual has now been published for twenty-one years, and presents each year to the profession a summary of medical literature covering the past twelve months. It opens with a general review of therapeutics and a dictionary of remedies, and this article is followed by a special one on the use of the *x*-ray in surgery, and another upon electrotherapeutics. After this comes a general review of medicine and surgery; a dictionary of treatment; a consideration of the surgical treatment of cirrhosis of the liver; an article upon the diseases of Egypt; still another upon hip-joint affections; another upon the sanitarium treatment of phthisis; one upon radiography of urinary stone; and a final one upon sanitary science. Altogether the book covers nearly 700 octavo pages. The present volume is not as copiously illustrated as some of the previous volumes have been, but is nevertheless a very creditable production, and offers many suggestive hints to the general practitioner.

Correspondence.

LONDON LETTER.

By George F. Still, M.A., M.D., F.R.C.P.

We have heard so much recently in London of subcutaneous injection of paraffin as a method of rectifying the disfigurements which result from certain diseases of the nasal bones and cartilages, that we are hardly surprised now to hear of a further extension of its use in a way which promises to be of considerable practical value. Mr. Stephen Paget at the Clinical Society this month described two cases of prolapse of the rectum, and one of prolapse of the uterus, in which after years of distress and after failure of all sorts of treatment the patients were cured at last by injection of paraffin into the submucous tissue. All three cases were over sixty years of age; in one a man had undergone excision of the rectum for cancer, and since then the bowel continually prolapsed and he had no control over the feces, and so was obliged to wear a rectal plug. Injection of paraffin produced two firm bulging masses under the mucous membrane which closed the bowel and prevented prolapse, but did not prevent defecation, although there was no longer involuntary escape of feces. In another case where prolapse had occurred for twenty-two years, a firm collar of injected paraffin in the submucous tissue, together with an operation narrowing the anus, produced a cure. Similarly the artificial tumor produced in the submucosa of the vagina prevented prolapse of the uterus which had recurred for twenty-eight years; such a procedure, however, it was pointed out, would not be available until the age of child-bearing was past. The question of risks arising from the injection was raised. Apart from the obvious risk of sepsis, there is a risk of embolism (one case of pulmonary embolism following subcutaneous injection of paraffin is on record). Mr. Paget said that bad results were usually due to using the wax too soft, or in too great quantity at one injection; the melting-point of the wax is a point of great importance. Gersuny, who is mainly responsible for the original introduction of this method of treatment, formerly used paraffin which melted at 104° F. But this is certainly unsatisfactory; one unfortunate individual who had been treated with paraffin of this kind happened to develop some illness with a temperature of 105°, and found the artificial part of him melting into fluid. Mr. Paget considers that a paraffin with a melting-point between 111° and 115° F. is best.

I fancy some correspondence which has recently been appearing in London medical journals, on chloretone as a remedy for seasickness, will be of interest to many practitioners; there is something so very humiliating in our inability to prevent so common a trouble as *mal de mer*. Chloretone is apparently a veritable *multum in parvo;* it is an excellent antiseptic, it is a local anesthetic, it is a reliable hypnotic, and now it turns up in the rôle of a cure for seasickness. A ten-grain dose to start with, and then five-grain doses every three hours until the headache and sickness are relieved—these are the directions given. The drug can be obtained in five-grain tablets; and if the experience of those who have already used it is confirmed by extended trial, the stewardess may lay aside her basins, for there will be no "landlubbers lying down below."

I referred in my last letter to the first of the year's Lettsomian Lectures by Dr. Radcliffe Crocker. He has now completed the series, and has touched upon so many practical points, and given so many valuable hints for treatment, that I shall make no excuse for devoting a great part of the space allotted to me this month to the therapeutic indications which he mentioned. In senile eczema the condition is not merely a local one, it is often dependent upon defective elimination; the intestinal action is sluggish, the kidneys are not working well; the latter should be washed through with free drinking of weak alkaline waters, such as Contrexéville, or simple hot water, preferably distilled, and the lower bowel should be kept empty by aperients—in short, "get as much out of the worn-out organs as medical resources permit."

The frequency of bromide and iodide eruptions, although the doses given may have been much smaller than in other cases where no such eruption has occurred,

is due probably to failure of excretion by the kidneys, and the occurrence of such a rash should always lead to careful examination of the urine, and also of the heart. Iodide of potassium should not be given to persons suffering from acne rosacea, which is often aggravated by it; and bullous eruptions such as pemphigus or dermatitis herpetiformis may become much worse, and even hemorrhagic or gangrenous, if potassium iodide is used.

In the treatment of psoriasis, arsenic should never be given when the eruption is appearing and spreading rapidly; under these conditions it makes the evolution of the eruption even more rapid. The continued use of arsenic for long periods is always fraught with some danger, not merely of pigmentation, but also of producing thickening of the horny layer of the skin of the palms and soles, a condition which may eventually end in epithelioma of the affected part.

Arsenic is of value not only in psoriasis, but also in lichen acuminatus, in erythema hæmorrhagicum—that is, recurring erythema with some purpura, a form of eruption which is most common on the legs—and also in the recurring sweat eruption, which, in the form of small vesicles along the sides of the fingers, is common in many people in summer. In chronic urticaria, in pemphigus, and also in the prevention of bromide and iodide eruptions, the value of arsenic has long been recognized. On the other hand, arsenic is useless in acute or subacute eczema, though occasionally it does good in chronic scaly forms of eczema; it is indeed seldom to be used in any acute inflammation of the skin.

Dr. Crocker thinks that the best method of administering arsenic is by the mouth, as liquor arsenicalis; this he thinks is better than the liquor sodii arsenatis. The advantage usually claimed for the latter is that it is less irritating to the stomach, but this is probably a fallacy, for in comparing the two preparations it is often forgotten that a given dose of liquor arsenicalis contains double the quantity of arsenic which is present in the same dose of liquor sodii arsenatis, and therefore double the dose of the latter drug would have to be given to obtain the same effect. He is also doubtful of the value of cacodylate of sodium, and suggests that its action may not be the same as that of other forms of arsenic.

An interesting suggestion for the treatment of psoriasis was the use of salicin or sodium salicylate. This must be given in full doses, 15 to 30 grains, three times a day; and used thus was found to be even more effective than arsenic. In 75 per cent it produced some improvement, in 20 to 30 per cent it cured. One advantage of this treatment is its suitability to any stage of the disease; unlike arsenic, it does good even when the eruption is rapidly developing. Salicin is valuable in several other skin conditions, such as lichen planus, pityriasis rosea, pemphigus, dermatitis herpetiformis, and especially in some of the more acute and wide-spread forms of lupus erythematosus. Aspirin may be used in psoriasis instead of the salicylates, but its slight solubility (5 grains to the ounce) and its high price are against it.

The value of thyroid extract in some diseases of the skin is undoubted; sometimes in the late stages of psoriasis it acts like a charm, and in lupus vulgaris it has a more beneficial effect than any other internal medication.

At the Pathological Society a point which may be of great prognostic value in connection with nephritis was brought forward by Dr. Herringham; he found that the excretion of sodium in the urine failed almost completely in a certain number of cases of nephritis, and that in these cases a fatal ending was not long delayed. In eleven cases of chronic interstitial nephritis six showed extremely little or no sodium in the urine; these six all died; the remaining five, whose excretion of sodium remained fairly normal, did not die. Similarly, out of nine cases of parenchymatous nephritis only two showed absence of sodium from the urine, and these two died; the other seven recovered. It is to be hoped that the necessary analysis is reasonably simple; so many of the modern so-called clinical methods might better be called "clinical-laboratory methods," for they are quite impracticable for the majority of practitioners.

A debate of more than usual interest has just been concluded at the Chelsea Clinical Society on diabetes, and although it

would be quite outside the scope of my letter to give any full account of the various views expressed as to the pathology and chemistry of that disease, I think that many of the remarks on treatment may well be mentioned here, for they embodied some of the most recent therapeutic developments in connection with diabetes. The debate was opened by Dr. Hale White with an admirable address on the pathological aspects of glycosuria, pointing out that while it was well recognized that glycosuria might be a harmless symptom, the practical difficulty often was to distinguish such a benign affection from the dangerous condition which we mean by "diabetes." In the dieting of diabetic patients the value of levulose is often overlooked, he said; this may be given in any quantity so long as it does not increase the amount of sugar in the urine. Inulin also, which is the starch corresponding to levulose, is useful in place of potatoes; it occurs in dahlia tubers, which can be cooked and eaten like potatoes. Like most of the subsequent speakers, he thought a rigid exclusion of carbohydrates was sometimes harmful; and when it was desired to allow a small amount of carbohydrate food, milk was a good way of giving it. He referred to one point, which is rather striking in the recent therapeutics of diabetes, namely, the disfavor into which morphine and codeine seem to have fallen; at one time these were almost routine remedies for the disease, and as they certainly seemed to reduce the amount of sugar in the urine, and this was admitted by several speakers to be the immediate object of treatment, it hardly seemed a satisfactory explanation for their disuse that, as one speaker said, "opium is bad as routine treatment, for it tends to retard metabolism." The use of aspirin was mentioned; in some cases it had seemed to diminish the excretion of sugar. Any drowsiness suggestive of oncoming coma might be treated by free drinking of alkalinized milk (sodium bicarbonate 100 grains, or sodium carbonate 50 grains, to the pint of milk), of which the patient might take three or four pints in the day. This seems to ward off the diabetic coma for a time.

Dr. Pavy said that after all sugar has disappeared and the patient has improved in general health, there comes a time when the patient begins to feel unsatisfied by the restricted diet, and to become weaker and lose weight in spite of the absence or slightness of sugar in the urine. This is an indication for the allowance of some carbohydrate food, and he would allow one ounce of wheaten bread at each of the three principal meals. After a time the patient would show similar symptoms again without increase of sugar in the urine, and the allowance of bread might then be cautiously increased to seven, eight, or even twelve ounces a day. In this way the gradual return of power of assimilation for carbohydrate food is encouraged.

The question of giving alcohol raised some discussion; but on the whole it seemed advisable to allow alcohol in moderate quantity to diabetics to supply that energy which a carbohydrate-free diet fails to supply. Dr. Saundby considered that potatoes are often useful in diabetes; they certainly do not contain so much starch as gluten bread, and while bread contains 50 per cent of starch, potatoes contain only 15 to 20 per cent.

PRURITUS ANI.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: There continues to be much written in regard to the treatment of pruritus ani. I picked up the *Denver Medical Times* not long since, and noticed this quotation from the *Journal of the American Medical Association:* "Edward Andrews recommends rectal irrigation with hot water, by means of a hard-rubber rectal tube with attachments of soft-rubber tubing."

I have been treating pruritus ani for years with dry calomel. I have the patient wash the anus after each evacuation, and dry it either with absorbent cotton or soft linen, and apply about 20 grains of calomel with the fingers. I have never failed to cure a case with this treatment. I cured one man who told me he had been troubled with it for forty years. In connection with the anal treatment I have the patient take light doses of Epsom salts; this is all the medicine I administer, directing him to use the water as warm

as he can stand it. The calomel stops the itching at once, and the patient is well in a couple of weeks.

Ointments of all kinds are filthy, and disappointing. If the itching extends up the rectum, the calomel is still all that is required.

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WASHINGTON, NEVADA CO., CAL.

THE NEW INDEX MEDICUS.

To the Editor of the THERAPEUTIC GAZETTE.

SIR: I was greatly astonished to learn a few days ago that up to that date only 251 subscribers to the new *Index Medicus* had been received from the entire profession abroad and at home. This at $5 each only provides $1255. The Carnegie Institution have very generously offered to make up any deficit up to $10,000 a year for three years. If the profession does not show sufficient interest in the publication of the *Index Medicus*, we can hardly expect the Carnegie Institution to continue this generous gift indefinitely, and the *Index* will then die again and finally. The time and trouble necessary to obtain the bibliography for a single paper of importance are worth more than the entire annual cost of the *Index*.

I very earnestly hope that the profession will come to the help of the *Index* and make it a splendid success. I suspect that the paucity of subscriptions must be due to a misapprehension—*i.e.*, that the Carnegie Institution intends to publish it at its own cost and risk indefinitely. This, as I have pointed out, is an error.

Yours very truly,

W. W. KEEN.

PHILADELPHIA.

Notes and Queries.

ANESTHESIA AND SWEARING.

The English armies, as we learn from Uncle Toby, swore terribly in Flanders; and if the testimony of Mr. Kipling is to be accepted they do the same at the present day in India and elsewhere. In civil life the strong language of our ancestors has to a large extent been replaced by meaningless slang. It would have been impossible to damn every one and everything more comprehensively or more consistently than Lord Melbourne, the political mentor of the late gracious sovereign, Queen Victoria. Fifty or sixty years ago surgeons, like other folk, swore freely; and if they are now less full of strange oaths, that is due partly to what Matthew Arnold called the stream of tendency, and partly to a wider diffusion of training in the liberal arts which has softened the ferocity of our manners.

In the Hunterian Oration delivered the other day Sir Henry Howse expressed the opinion that the disuse of profane language among surgeons might be regarded as one of the blessings of chloroform. Anesthesia, according to the President of the Royal College of Surgeons of England, removed "the necessity for the surgeon to express himself in such forcible and inelegant terms as was necessary previously for the control of his patient." We venture to think that this theory is unfair to the surgeons of preanesthetic times. Men are apt to use strong language when they are strongly moved, and in the old days many surgeons may have sworn during operations, as boys whistle in going through a graveyard at night, to give themselves courage. We know what men like Chelselden, Charles Bell, and Astley Cooper suffered when they had to undertake a serious operation, and how they had to nerve themselves for the task. In the old days surgeons as a class unquestionably were rougher in manner and language than they are nowadays, but that is because only men of blood and iron could have practiced the art of chirurgery under the conditions then existing. We decline to believe, however, that our predecessors were brutal enough to swear at the patients who were shrieking under the knife, and we cannot admit that the introduction of anesthesia removed "the necessity for strong speech and roughness of manner in the veterans who have gone before us." The implied doctrine that strong language can ever be "necessary" for the control of patients in the hands of surgeons strikes us as liable to misinterpretation by the ingenuous youth, who naturally accept the utterances of a man in the position of Sir Henry Howse as authoritative.—The London *Lancet*.